Maintaining and Troubleshooting the Gateway ALR 8300 Server

Notices

Contents

Preface

Conventions used in this guide

Throughout this guide, you will see the following conventions:

Convention	Description
ENTER	Keyboard key names are printed in small capitals.
CTRL+ALT+DEL	A plus sign indicates that the keys must be pressed simultaneously.
Setup	Commands to be entered, options to select, and messages that appear on your monitor are printed in bold.
User's Guide	Names of publications and files are printed in italic.
★ *Important!*	An important informs you of special circumstances.
▼ *Caution!*	A caution warns you of possible damage to equipment or loss of data.
⚠ *Warning!*	A warning indicates the possibility of personal injury.

Safety instructions

Observe the following safety instructions when using your system:

- Follow all instructions marked on the system and in the documentation.

- When the computer is turned off, a small amount of electrical current still runs through the computer. Always unplug the computer from the electrical outlet before cleaning the system or opening the computer cover. (Follow the cleaning instructions in your user's guide.)

- Do not use this product near water or a heat source, such as a radiator or heat register.

- Do not spill anything on or into the system. The best way to avoid spills is to avoid eating and drinking near your system.

- Make sure you set up the system on a stable work surface.

- Openings in the computer cabinet are provided for ventilation. Do not block or cover these openings. Make sure you provide adequate space (at least 12 inches) around the system for ventilation when you set up your work area. Never insert objects of any kind into the computer ventilation slots.

- Use the voltage setting for your area. The voltage selector switch is set at the factory to the correct voltage.

- As a safety feature, this system is equipped with a 3-wire power cord to ensure that the product is properly grounded when in use. The plug will only fit into a grounding-type outlet. If you are unable to insert the plug into an outlet, contact an electrician to install the appropriate outlet.

- Do not walk on the power cord or allow anything to rest on it.

- If you use an extension cord with this system, make sure the total ampere ratings on the products plugged into the extension cord do not exceed the extension cord ampere rating. Also, the total ampere requirements for all products plugged into the wall outlet must not exceed 15 amperes.

⚠️ *Warning!*

Do not attempt to service the system yourself except as explained elsewhere in the system documentation. Adjust only those controls covered in the instructions.

Opening or removing covers marked "Do Not Remove" may expose you to dangerous electrical voltages or other risks.

Refer all servicing of those compartments to qualified service personnel.

- There is a danger of explosion if the CMOS (complementary metal-oxide semiconductor) battery is replaced incorrectly. Replace the battery with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

- Unplug the system from the wall outlet and refer servicing to qualified personnel if:

  - The power cord or plug is damaged.

  - Liquid has been spilled into the system.

  - The system does not operate properly when the operating instructions are followed.

  - The system was dropped or the cabinet is damaged.

  - The system's performance changes.

Additional information sources

Along with this manual and your user's guide, you can find additional information by using the following sources.

The Gateway Support Center

Log on to the Gateway Support Center at www.gateway.com/support to access information about your system or other Gateway products. Some types of information you can access are:

- Hardware driver (including BIOS) and software application updates
- An expanded glossary
- Technical tips
- Service Agreement information
- Technical documents and component information
- Frequently Asked Questions (FAQ)
- Online access to Tech Support

1

System Access

Static electricity precautions

Static electricity can permanently damage electronic components in your computer. When opening your computer case, always perform the following procedure:

1. Wear a grounding wrist strap (available at most electronics stores).

2. Turn off the system power.

3. Touch the back of the power supply fan, located on the back of the case, to discharge any static electricity.

4. Unplug all power cords from AC outlets.

5. Remove the computer case cover.

Follow these precautions to avoid electrostatic damage to your system components:

- Avoid static-causing surfaces such as plastic and styrofoam in your work area.

- Remove the parts from their antistatic bags only when you are ready to use them. Do not lay parts on the outside of antistatic bags since only the inside of the bag provides antistatic protection.

- Always hold cards by their edges and their metal mounting bracket. Avoid touching components on the cards and the edge connectors that connect to expansion slots.

- Never slide cards or other parts over any surface.

Opening the system

Depending on your purpose, you may need to remove only one or all of the system covers. Follow the instructions specific to the cover you want to remove, as indicated in each section.

Removing the side panel

You must remove the side panel before you can remove the bezel or the wrap-around panel.

To Remove the Side Panel

1. Disconnect all power cords. Unlock the chassis keylock if necessary.

2. On the rear of the system, remove the two screws that secure the side panel to the chassis. Save the screws (see Figure 1).
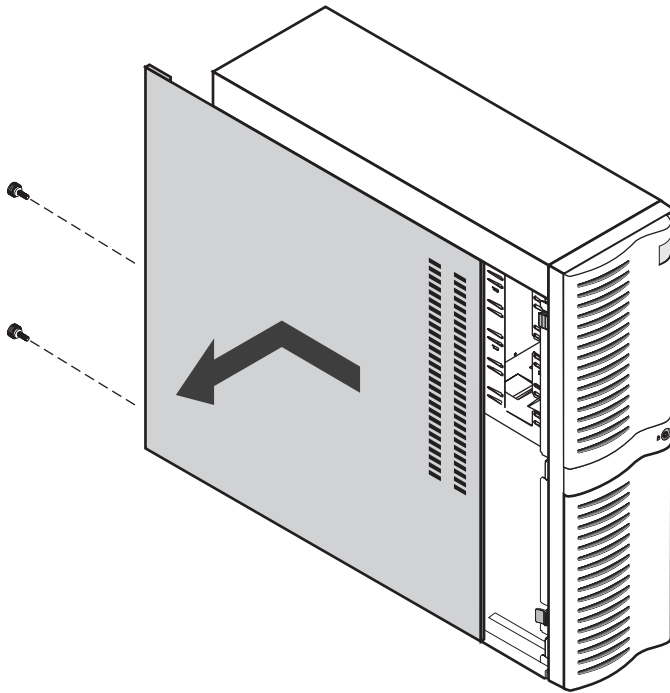
Figure 1: Removing the Side Panel

3. Slide the panel back and gently pull it off of the chassis.

4. Set the panel aside.

Removing the wrap-around panel

You must remove the side panel before removing the wrap-around panel. You may need to remove the wrap-around panel before removing the bezel.

To Remove the Wrap-around Panel

1. Disconnect all power cords. Unlock the chassis keylock if necessary.

2. Remove the side panel as described above.

3. Remove the two screws from the rear of the system and the screw at the top of the system that secure the panel to the chassis (see Figure 2).
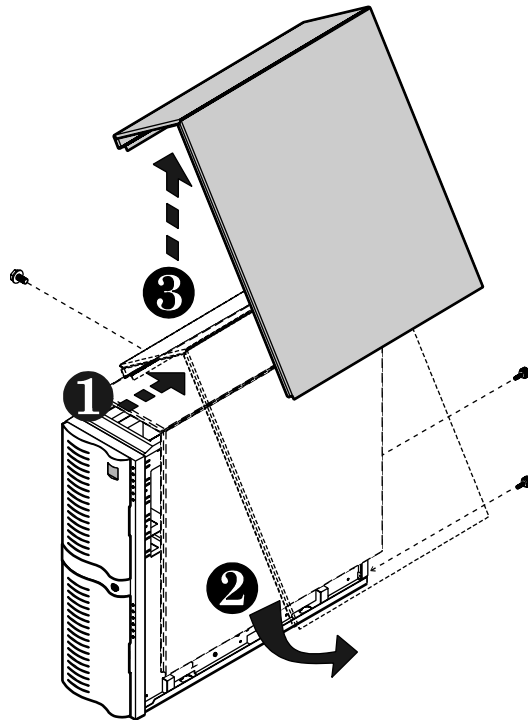
Figure 2: Removing the Wrap-Around Panel

4. Slide the panel backward a few inches.

5. Lift the bottom of the panel outward so that its top is angled on the chassis, as shown in Figure 2.

6. Lift the panel up and off of the chassis and set the panel aside.

Removing the bezel

You must remove the side panel and the wrap-around panel before you remove the bezel.

To Remove the Bezel

1. Disconnect the power cords. Unlock the bezel keylock if necessary.

2. Remove the side panel, as described in "Removing the side panel" on page 3.

3. Disconnect the two ribbon cables that link the bezel LED indicators to the interior of the system.

4. Remove the six screws that secure the bezel to the chassis, as shown in Figure 3. Set the screws aside.
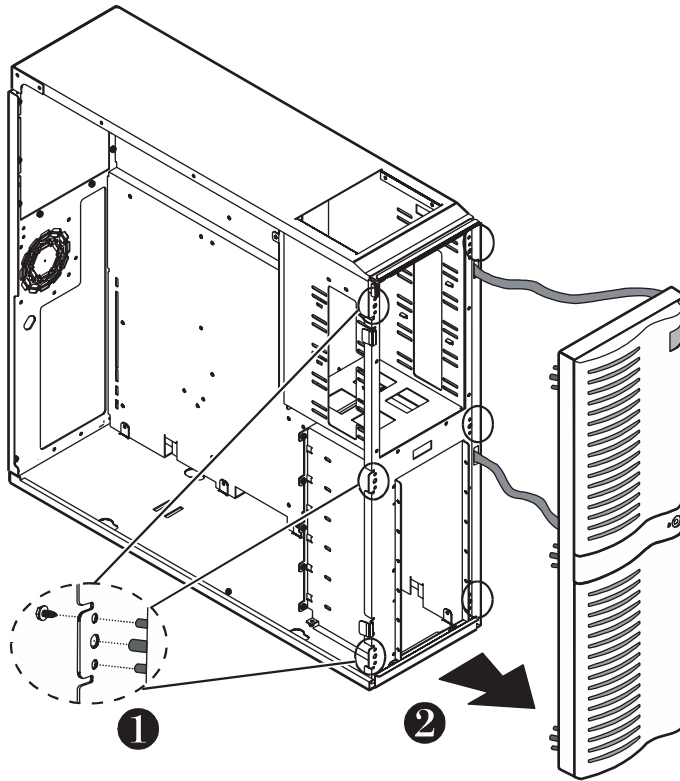
Figure 3: Removing the Bezel

5. Gently pull the bezel off of the chassis and lay it aside.

Closing the system

Before closing the system, verify that all connectors and boards are properly installed and firmly seated.

Reinstalling the bezel

You must replace the bezel before you replace the wrap-around panel and the side panel.

1. Position the bezel to the front of the chassis so that the bezel pegs are aligned with the mounting holes on the front of the chassis. See Figure 4.
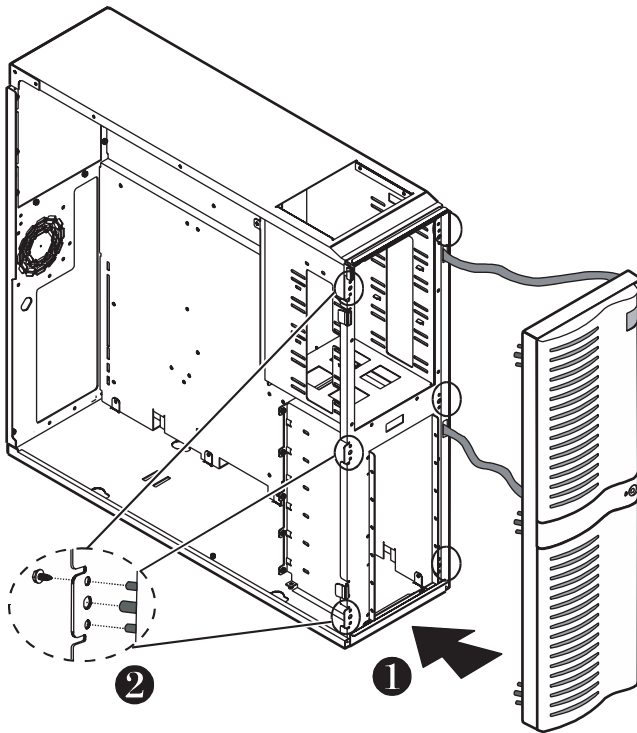
Figure 4: Reinstalling the Bezel

2. Carefully thread the ribbon cables through the openings in the chassis and connect them to the appropriate connectors. See Figure 7 on page 12 for the locations of the connector on the system board and see the RAID Cage Configuration Guide for the location of the connector on the RAID bay backplane.

3. Secure the bezel with the screws you removed when removing the bezel.

Reinstalling the wrap-around panel

You must replace the bezel before you replace the wrap-around panel. You must replace the wrap-around panel before you replace the side panel.

To Replace the Wrap-around Panel

1. Hold the wrap-around panel at a slight angle over the chassis as shown in Figure 5.
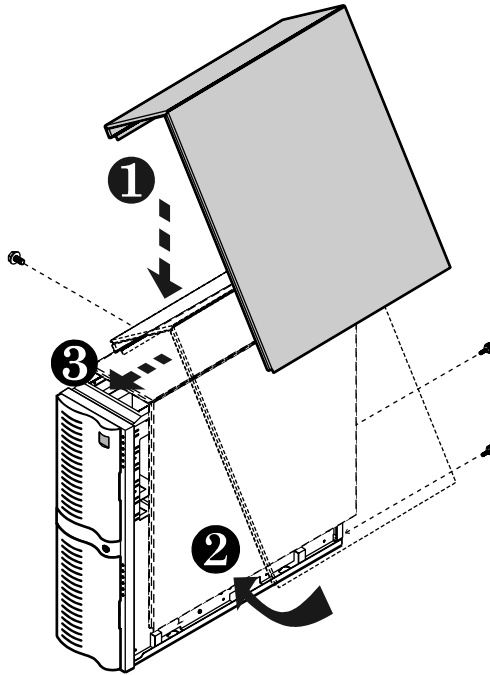
Figure 5: Reinstalling the Wrap-Around Panel

2. Lower the panel and anchor its top edge to the chassis.

3. Gently release the panel so that its side is flush against the chassis.

4. Slide the panel forward until it is locked into place.

5. Secure the panel with the screws you removed when you removed the wrap-around panel.

Reinstalling the side panel

You must replace the bezel and the wrap-around panel before you replace the side panel.

To Replace the Side Panel

1. Align the panel with the chassis ledges just a few inches towards the back of the chassis. (See Figure 6.)
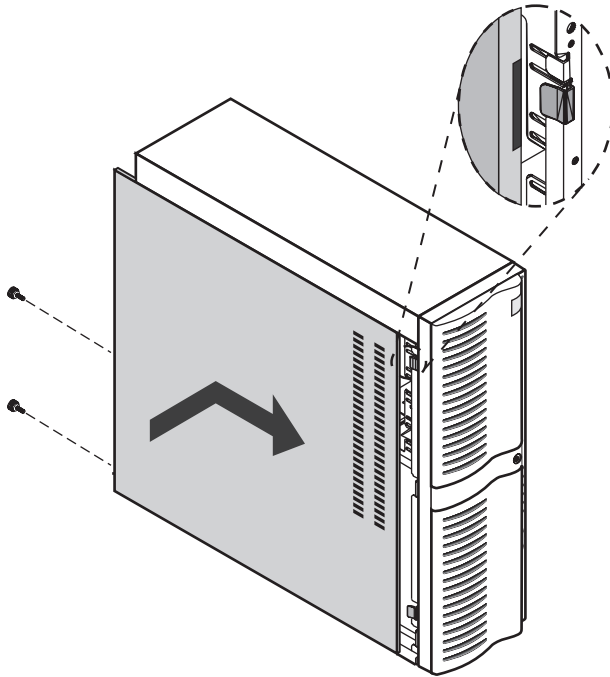
Figure 6: Reinstalling the Side Panel

2. Verify that the slots on the panel are aligned with the locking tabs on the chassis.

3. Slide panel towards the front of the system until the panel is locked into place.

4. Secure the panel with the screws you removed when you removed the side panel.

2

Components

System board

The system board functions as the main interface between the processor, memory, and peripherals. See the table below and on the following page for the key to Figure 7.
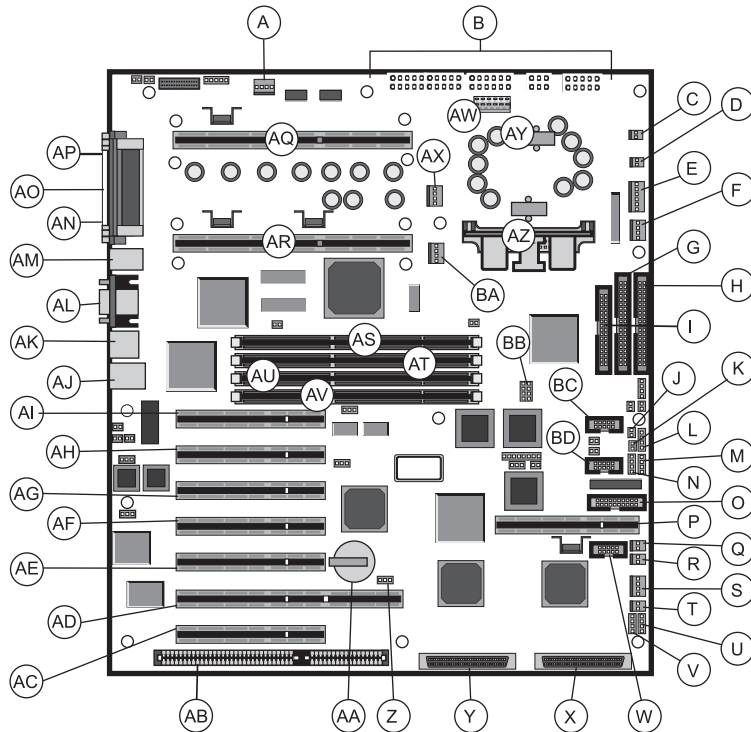
Figure 7: System Board Components

A Chassis fan connector
B Power connectors
C Soft power connector
D PS fault reset connector
E Power supply auxiliary connector
F Chassis fan connector
G Secondary IDE connector
H Primary IDE connector
I Diskette drive connector
J SHM mode jumper

K Reset connector

L Front panel connector

M External hard drive connector

N Hard drive LED connector

O Server management connector

P I_2O connector/secondary PCI slot 1

Q User NMI connector

R EDC reset connector

S Chassis fan connector

T Cover intrusion switch connector

U Speaker connector

V External boot ROM connector

W External I_2C connector

X SCSI B connector

Y SCSI A connector

Z Clear CMOS jumper

AA Battery

AB ISA slot 1 (shared w/secondary PCI slot 4)

AC Secondary PCI slot 4 (shared w/ ISA slot 1)

AD Secondary PCI slot 3/RAID-port slot

AE Secondary PCI slot 2

AF Secondary PCI slot 1 (shared w/ I_2O slot)

AG Primary PCI slot 3

AH Primary PCI slot 2

AI Primary PCI slot 1

AJ RJ-45 ethernet port

AK Stacked dual USB ports

AL Video port

AM Mouse port/keyboard ports

AN Serial port 2

AO Parallel port

AP Serial port 1

AQ Boot processor connector (CPU 1)

AR Application processor connector (CPU 2)

AS DIMM bank A

AT DIMM bank B

AU DIMM bank C

AV DIMM bank D
AW Optional power connector
AX Processor 1 fan connector
AY Embedded VRM for processor 1
AZ Optional VRM for processor 2
BA Processor 2 fan connector
BB Processor speed setting jumper
BC RAID cage connector
BD LED display connector

Chassis fans (A, F, S)

There are several chassis fan connectors on the system board. These connectors provide power for cooling fans that may be positioned in several parts of the chassis to provide cooling for critical components.

Power connectors

There are several power connectors on the system board. These connectors are intended to allow the connection of different power supplies for different system configurations. Some of these connectors are not used.

Standard power connectors (B)

The power connectors provide all of the power to the system board. These connectors are designed to accommodate the power supply installed in the system.

Soft power connector (C)

The soft power connector provides for a power switch that causes the system to power up or power down from a standby state.

Power supply auxiliary connector (E)

Provides additional connections from the power supply to the system board.

Optional power connector (AW)

This power connector provides an alternative connection for use with a different power supply. This connector is not used in this system.

Front panel connectors

There are several connectors designed to transfer signals between the front panel and the system board. Many of these connectors are redundant and are included to allow the system board to be installed in different chassis. Some of these connectors are not used.

PS fault reset connector (D)

Allows connection of a reset switch for processor fault conditions. This switch will not reset the processor or remove the fault condition, it clears the fault alert flag and causes the fault LED to turn off. If the fault condition persists, the processor fault LED will turn back on.

Front panel connector (L)

The front panel connector provides the signals for the front panel indicator LEDs and the front panel buttons. Not used in the system.

Reset connector (K)

The reset connector provides the connection of the reset button from the front panel.

External hard drive connector (M)

The external hard drive connector allows you to connect a cable from an external hard drive to the system board to allow the hard drive activity LED and system monitoring to recognize the external drive.

Hard drive LED connector (N)

This connector allows you to connect all of the hard drives to the hard drive activity connector on the front panel.

User NMI connector (Q)

This connector allows the connection of a switch that lets a user generate a non-maskable interrupt (NMI). This connector is not used.

EDC reset connector (R)

The EDC reset connector provides the connection for the keyboard lock button/ECC reset button from the front panel. Not used.

Speaker connector (U)

Connects the internal speaker to the system board.

External boot ROM connector (V)

Provides connection for expansion cards that contain a separate boot ROM and require separate access to the system board. This connector is for factory use only.

LED display connector (BD)

Connects the LEDs on the front panel to the system board. Includes the keyboard lock button signals and the reset button signals.

Drive controllers and connectors

The system board supports several controllers for drives and other peripherals. Connectors to link these controllers to the appropriate devices are also provided.

Secondary and primary hard drive connectors (G, H)

This is an integrated dual-channel Ultra-DMA PCI/IDE interface with two IDE connectors capable of controlling up to four IDE devices and supporting PIO Modes 0-4. Ultra-DMA provides faster access to IDE devices that are Ultra-DMA compliant while maintaining support for IDE devices that do not support the Ultra-DMA specification.

Diskette drive connector (I)

The diskette drive controller and connector on the system board support up to two diskette drives of 360 KB, 720 KB, 1.2 MB, 1.44 MB, and 2.88 MB formats.

SCSI connectors (X, Y)

This integrated Adaptec® AIC™-7890 SCSI controller is a high-performance, PnP compliant, single-chip PCI local bus-to-Ultra2 SCSI master host adapter. Its advanced SCSI I/O cell technology ensures data integrity for higher I/O bandwidth requirements with data rates of 40-MB/sec in Ultra mode and 80-MB/sec in Ultra2 mode.

Additional features:

- Dual LVD 16-bit (68-pin) PCI-to-Wide Ultra2 SCSI connectors
- Full 32-bit PCI bus master implementation maximizing data transfer on PCI local bus at 133 MB/sec data bursts
- SCAM (SCSI Configured Automatically) Level 1 for Windows 95®, enabling automatic configuration of new devices without having to reboot the system.

- Wide SCSI configuration supporting up to 15 connected SCSI peripherals per channel for as many as 30 devices. As many as seven 8-bit devices can be installed on each channel.

- Multi-threading support for up to 255 simultaneous I/O tasks

- Advanced SCSI I/O cell ensuring data integrity by automatically and continuously adjusting slew rate to compensate for SCSI bus loading

- Driver support for all major operating systems.

System jumpers

These jumpers allow you to set certain characteristics of the system. Some jumpers are reserved and are not described in this section. Do not change any jumper unless it is necessary to configure the system. In some cases, changing the settings of reserved jumpers can cause damage to the system board. For instructions on setting the jumpers on the system board, see "Setting system board jumpers" on page 32.

SHM mode jumper (J)

This jumper indicates whether the system is a tower unit or rack mounted. The system hardware manager (SHM) software checks this jumper to determine the characteristics of the system.

Clear CMOS jumper (Z)

This jumper allows you to clear the CMOS memory. You should only do this if you cannot access the normal methods of modifying the CMOS and modifications to the CMOS are necessary. Clearing CMOS memory returns all BIOS Setup settings to the default values.

Processor speed setting jumper (BB)

This jumper allows you to set the speed of the processor. Both processors, in dual processor configurations, must have the same speed rating. If processors of different speeds are used in the same system, the processors must run at the speed of the slower processor.

Server management connectors

The server management connectors provide hardware and component monitoring to assist you in maintaining the server.

Server management connector (O)

The server management connector allows you to connect a server management device to the system board to monitor system activities.

I_2O connector (P)

The I_2O connector allows you to install a dedicated intelligent input/output (I_2O) board. This feature was not fully implemented at the time this guide was printed.

Cover intrusion switch connector (T)

Connects a cover intrusion switch to the system board so that the system can monitor unauthorized access to the chassis.

External I^2C connector (W)

This connector is part of the system monitoring hardware. It carries the signals of the I^2C bus which include identifying information and status for major system components.

RAID cage connector (BC)

The RAID cage connector connects the SCSI backplane to the system board to allow status and monitoring of backplane fan activity. The signals provide backplane fan tachometer readings. Not implemented in this system.

Battery (AA)

Provides the power to maintain the CMOS memory when the system is turned off or unplugged.

Expansion slots

The system features seven expansion slots: four PCI slots, one PCI slot/I_2O slot, one PCI/RAIDport, and one shared PCI/ISA slot. The shared slots, PCI/I2O and PCI/ISA, are represented by multiple connectors on the system board.

ISA slot connector (AB)

The ISA slot connector supports a single bus-master capable ISA expansion card. This connector shares space with secondary PCI connector 4.

PCI slot connectors (AC, AE, AF, AG, AH, AI)

The system board supports six connectors for installation of PCI cards. All PCI connectors are bus master capable. Three of these connectors, (AG, AH, and AI) reside on the primary PCI bus and three (AC, AE, and AF) reside on the secondary PCI bus.

The PCI bus processes peripheral transactions at a system clock speed of up to 33 MHz.

PCI/RAIDPort connector (AD)

The PCI/RAIDport connector allows you to install either a PCI expansion card or a dedicated RAIDport card into a single connector.

I/O connectors

The I/O connectors are located on the back panel of the system. Figure 7 on page 12 shows the locations of the connectors on the system board. Figure 8 below shows the connectors as they appear on the back panel.
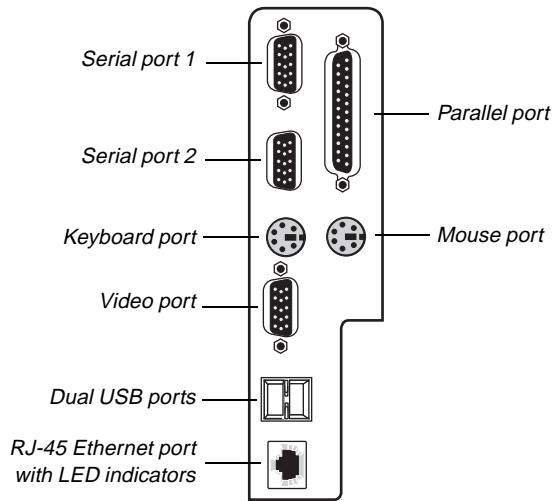
Figure 8: I/O Connectors

The following I/O connectors are included with the system:

- Two universal serial bus (USB) ports (AK in Figure 7):
  - USB ports provide connection for a growing list of peripheral components including mouse, keyboard, joystick, monitor, tape and floppy drives
  - As many as 127 devices can be daisy-chained from each port
  - Hot-swap capability and dynamic resource allocation for all peripherals attached
  - Data transfer rates of up to 12Mbps.
  - USB drivers are provided as a part of most major operating systems and should require no special procedures for implementation or use.

- Two 9-pin 16550-compatible serial ports (AN and AP in Figure 7)
- One bi-directional ECP/EPP parallel port (AO in Figure 7)

- One VGA video port (AL in Figure 7)

- One PS/2-style mouse port (part of AM in Figure 7)

- One PS/2-style keyboard port (part of AM in Figure 7)

- One RJ-45 Ethernet connector with two LED indicators (AJ in Figure 7). The green LED indicates a communication link has been established with the network and the yellow indicator shows that the communication is occurring at 100 Mbps when on and at 10Mbps when off.

Processor subsystem

The system board supports as many as two processors (CPUs). The board provides several additional connectors for supporting components, as described in the following paragraphs.

Processors and processor slots (AQ, AR)

Depending on the model, the system is equipped with one Intel Pentium® II Xeon™ processor with 512-KB, 1 MB, or 2 MB of ECC level-two (L2) cache integrated into a single edge contact (SEC) cartridge. The boot processor (AQ) must be present in all configurations. The application processor (AR) is optional.

The system SMP design supports up to two processors and is Intel MP Specification v1.1 and 1.4 compliant.

Processor fan connectors (AX, BA)

The processor fan connectors provide power for the fans mounted on the processor heatsinks. These fans cool the processors and prevent overheating. Note that not all processor heatsinks have or need fans. If the processor heatsink includes a fan, connect it to the correct fan connector. These connectors are not used in the standard configurations.

Voltage regulator modules (AY, AZ)

Each processor must have a dedicated voltage regulator module (VRM) that adjusts the voltage supplied to the processor. The VRM for the boot processor (CPU 1) is integrated into the system board.

Memory (AS, AT, AU, AV)

The system comes standard with 64 MB of error checking and correcting (ECC) RAM. System RAM is expandable up to 2 GB using 100 MHz ECC PC100-compliant 100 MHz 72-bit synchronous DRAM (SDRAM) DIMMs (4 DIMM sockets). System memory is PC 100 compliant.

The RAID backplane

The RAID backplane allows you to easily configure a reliable RAID subsystem. The RAID bay supports six 1-inch or 1.6-inch high 3.5-inch drives. For optimum operation, only approved, RAID-ready drives should be used with the RAID backplane.

Drives are mounted on a rail system, which provides quick and easy installation and hot-swapping capability. A fully functional RAID subsystem is controlled by a RAID Caching Controller.

Hot-swapping is a useful feature that allows you to replace a failed hard disk drive without interrupting system operation. In the event of a hot-swappable drive failure, in which the drive is part of a RAID 5 array, the system continues normal operation. The failed drive can be replaced and its contents rebuilt automatically on an equivalent replacement drive without interrupting the operation of the system.

To configure the backplane, refer to the RAID Cage Configuration Guide.

3

Installing
Components

Replacing the processor

The system is compatible with Intel Pentium® II Xeon™ processors.

You can either upgrade the existing Pentium II Xeon processor or install a second processor of the same speed as the original processor.

When replacing a processor, order a Pentium II Xeon processor upgrade kit. The kit includes the processor, a heat sink, and a disposable electrostatic discharge (ESD) wrist strap. For the latest details on the availability of the upgrade kits, contact one of the sources listed in the *Assistance Resources* document.

It is critical that a heat sink be installed on each processor. The Pentium II Xeon processor overheats and fails if it is not cooled sufficiently. The heat sink provided with the processor on the system provides all necessary cooling for the processor, as long as the system covers are on.

To Replace the Processor

1. Turn off the system and disconnect the power cord.

2. Open the case, observing the ESD precautions in "Static electricity precautions" on page 2.

3. Wearing an anti-static wristband grounded to the system chassis, remove the lock bar from the processor support. See Figure 9.
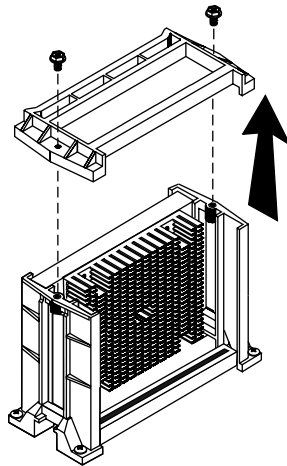
Figure 9: Removing the Lock Bar

4. Remove the two screws that secure the processor cartridge in the supports and remove the lock bar.

5. Lift the processor cartridge straight up and away from the system board. See Figure 10.
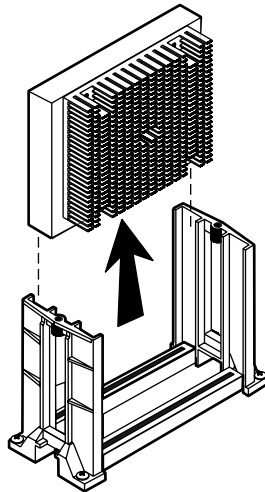
Figure 10: Removing the Processor Cartridge

★ *Important!*

If the error message "update table not found for CPUxx, Stepping xxxx" displays at boot up, run the MULOADER utility located on the disk included with your processor kit. This message may occur under the following conditions: When a new processor has been added that does not include the stepping information in the table. When the BIOS is flashed, it may remove the stepping information form the table which will cause the error message to appear.

6. Place the processor cartridge that you removed in a safe place.

7. Remove the replacement processor cartridge from its protective wrapping and place it in the cartridge supports for the slot 1 connector. See Figure 11.
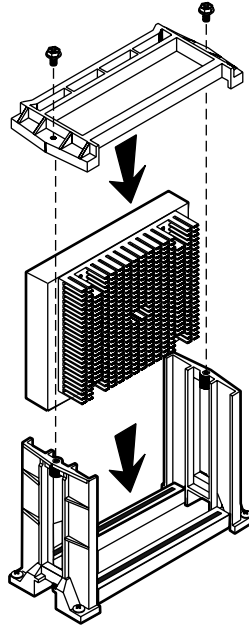
Figure 11: Installing the Processor Cartridge

8. Slide the cartridge all of the way down until it seats securely in the slot 2 supports.

9. Place the lock bar on the top of the processor cartridge and replace the two screws that secure it in place.

10. Set the jumpers properly for the new processor configuration.

11. Close the case, as described in "Closing the system" on page 7.

12. Reconnect the power cord and turn on the system.

Installing a second processor

The system is compatible with Intel Pentium® II Xeon™ processors.

You can either upgrade the existing Pentium II Xeon processor or install a second processor of the same speed as the original. When adding a processor, order a Pentium II Xeon processor upgrade kit. The kit includes the processor, a heat sink, and a disposable electrostatic discharge (ESD) wrist strap. For the latest details on the availability of upgrade kits, contact one of the sources listed in the *Assistance Resources* document.

It is critical that a heat sink be installed on each processor. The Pentium II Xeon processor overheats and fails if it is not cooled sufficiently. The heat sink provided with the processor on the system provides all necessary cooling for the processor, as long as the system covers are on.

To Install a Second Processor

1. Turn off the system and disconnect the power cord.

2. Open the case, observing the ESD precautions in "Static electricity precautions" on page 2.

3. Wearing an anti-static wrist strap grounded to the system chassis, remove the Terminator Card from the system board. See Figure 12.
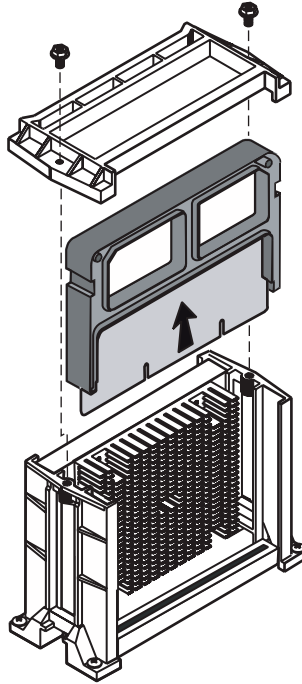
Figure 12: Removing the Terminator Card

4. Align the new Pentium II SEC cartridge in the Slot 2 supports and press it firmly into place until fully seated. See Figure 13.
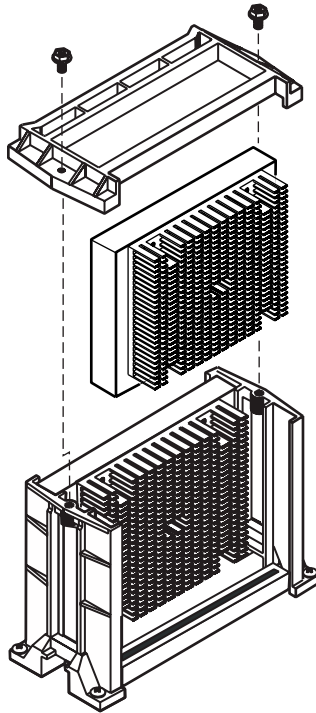
Figure 13: Installing the New Processor

5. Place the lock bar over the top of the processor cartridge and secure it in place with the two screws provided.

6. Set the jumpers correctly for the new processor configuration.

7. Insert the new VRM into the connector provided until the release latches click into place.

8. Close the case, as described in "Closing the system" on page 7.

9. Reconnect the power cord and turn on the system.

Setting system board jumpers

The system board jumpers let you change several system functions. Jumpers are set to the default positions at the factory. You may need to change the jumper settings to perform the following functions:

- Set processor/bus speed settings
- Clear CMOS memory
- SHM mode

Processor speed jumper

The system board supports a range of processor speeds, which are set by changing jumper shunts on the block. If you upgrade your processor, you may need to change jumper settings. The JP22 jumper configuration block lets you set the processor speed.

If two processors are present and they support different speeds, set the processor speed jumper to the slower speed. Move the jumper shunts on jumper block JP22 to connect the jumper pins according to the following table.

Pentium II Xeon	CPU Speed Settings JP22
400 MHz	
450 MHz	

Clear CMOS jumper

JP15 lets you clear all current values in complimentary metal-oxide semiconductor (CMOS) memory. CMOS memory stores all of the BIOS Setup information and settings. Clearing the CMOS memory restores all setup values to the original system defaults.

A jumper shunt connecting pins 1 and 2 supports normal operations. A jumper shunt connecting pins 2 and 3 clears the CMOS memory.

To Clear CMOS Memory

1. Turn off the system and disconnect the power cord.

2. Open the case, observing the ESD precautions in "Static electricity precautions" on page 2.

3. Move the jumper shunt on the JP15 jumper to connect pins 2 and 3.

4. Wait a few seconds (5–10) while the CMOS memory clears. It is not necessary to start up the system to clear CMOS memory.

5. Move the jumper shunt on the JP15 jumper back to its normal position connecting pins 1 and 2.

6. Close the case, as described in "Closing the system" on page 7.

7. Reconnect the power cord and turn on the system.

Clearing the CMOS memory clears all passwords and all configuration settings. You must reset any necessary values in BIOS Setup after you clear the CMOS memory.

★ *Important!*

If the error message "update table not found for CPUxx, Stepping xxxx" displays at boot up, run the MULOADER utility located on the disk included with your processor kit. This message may occur under the following conditions: When a new processor has been added that does not include the stepping information in the table. When the BIOS is flashed, it may remove the stepping information form the table which will cause the error message to appear.

SHM mode jumper

The SHM mode jumper indicates whether the system board is installed in a tower or rack system. When the system board is installed in a tower chassis, leave the jumper pins unconnected. When the system board is installed in a rack, the jumper pins must be connected. The SHM software checks the status of this jumper to determine whether the configuration and other characteristics of the server are correct for a system of the appropriate type.

To Set the SHM Mode Jumper

1. Turn off the system and disconnect the power cord.

2. Open the case, observing the ESD precautions in "Static electricity precautions" on page 2.

3. Install a jumper shunt on the jumper to connect the pins.

4. Close the case, as described in "Closing the system" on page 7.

5. Reconnect the power cord and turn on the system.

Installing memory and hardware

Installing memory

The system board supports up to 2 GB of RAM in unbuffered ECC SDRAM DIMMs. System memory is PC 100 compliant.

The system board is configured with 4 DIMM banks. You can fill Bank 0, Bank 1, Bank 2, or Bank 3, or a combination of banks with DIMMs. No jumper settings are required for the memory size or type because this information is automatically detected by the BIOS.

Refer to the DIMM configuration chart later in this section for valid memory configurations. You may select any combination that provides the total RAM required by your system and applications.

To Install DIMMs

1. Turn off the system and disconnect the power cord.

2. Open the case, observing the ESD precautions in "Static electricity precautions" on page 2.

3. Pull open the socket clamps on each side of the DIMM socket (see Figure 14).
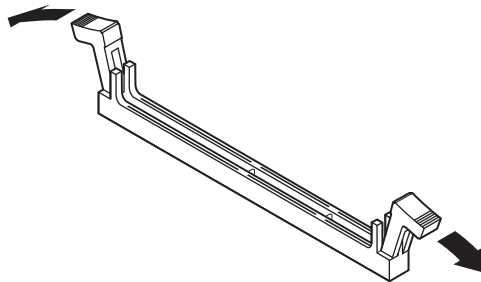
Figure 14: Opening the DIMM Socket Clamps

4. Insert the DIMM into the socket and align the two notches in the DIMM with the two notches in the DIMM socket (see Figure 15).
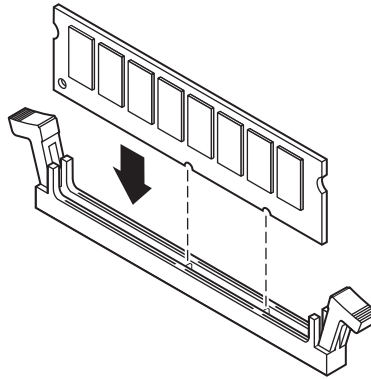
Figure 15: Installing the DIMM

5. Gently press the DIMM into the socket until it is securely seated. (Inserting the DIMM automatically locks each of the socket clamps on each end of the DIMM.)

6. Close the case, as described in "Closing the system" on page 7.

7. Reconnect the power cord and turn on the system.

To Remove DIMMs

1. Gently push out first one and then the other plastic socket clamp on each end of the DIMM. The DIMM should pop up slightly from the socket (see Figure 16).
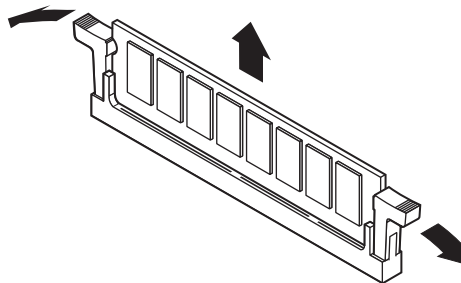
Figure 16: Opening the DIMM Socket Clamps

2. Carefully lift the DIMM out of the socket (see Figure 17).
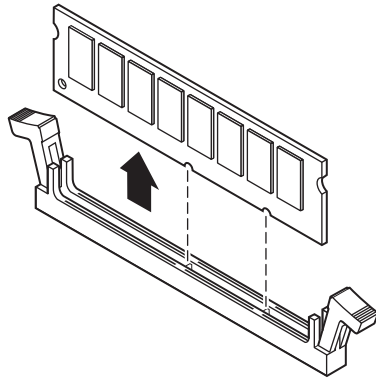
Figure 17: Removing the DIMM

3. Store the DIMM in a static-free container.

Adding and replacing drives

The case must be opened to add or change drives (such as disk drives and CD-ROM drives) in the system. Refer to Chapter 1, System Access, for instructions on opening and closing the case.

Replacing the CD-ROM drive

You can use the 5.25-inch drive bay to install a CD-ROM drive, tape drive, or other 5.25-inch device.

<div style="background:blue;color:white">

To Replace the CD-ROM Drive

</div>

1. Turn off the system and disconnect the power cord.

2. Open the case, observing the ESD precautions in "Static electricity precautions" on page 2.

3. Locate the CD-ROM drive.

4. Disconnect the power and data cables from the back of the drive, noting their location and orientation. (You will reconnect these cables after you install the new CD-ROM drive.)

5. Remove the screws securing the CD-ROM drive to the chassis and remove the CD-ROM drive (see Figure 18).
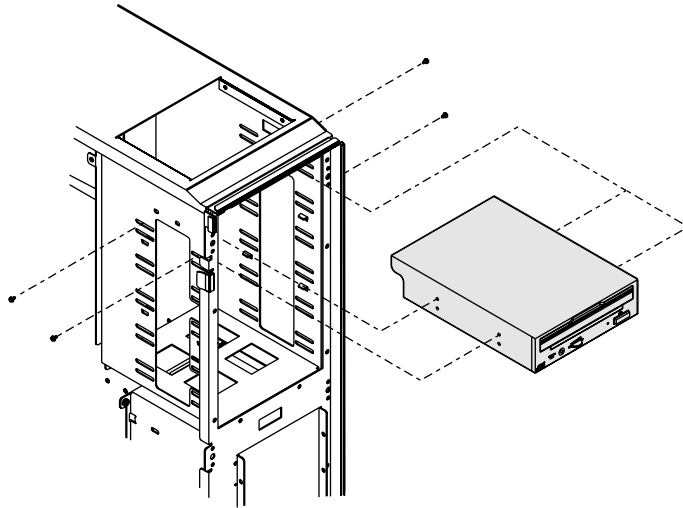
Figure 18: Replacing the CD-ROM Drive

6. Place the new CD-ROM drive in the chassis and secure the drive to the chassis using the screws you removed in Step 5.

7. Connect the power and data cables to the CD-ROM drive, making sure the cables match their original position. (See drive documentation for proper drive jumper settings and cable orientation.)

8. Close the case, as described in "Closing the system" on page 7.

9. Reconnect the power cord and turn on the system.

Installing a drive in the 5.25-inch drive bay

You can use the 5.25-inch drive bay to install a CD-ROM drive, tape drive, or other 5.25-inch device.

To Install a Drive in the 5.25-inch Drive Bay

1. Turn off the system and disconnect the power cord.

2. Open the case, observing the ESD precautions in "Static electricity precautions" on page 2.

3. Locate the 5.25-inch drive bay.

4. If no drive is installed in the drive bay, remove the metal drive bay cover from the front of the 5.25-inch drive bay. Also, remove the corresponding plastic drive bay cover on the front bezel.

   If you are replacing an existing drive, disconnect the power and data cables from the drive, noting their location and orientation. (You will reconnect these cables after you install the new drive.)

5. If you are replacing an existing drive, remove the screws securing the drive to the chassis, then remove the drive from the chassis (see Figure 19).
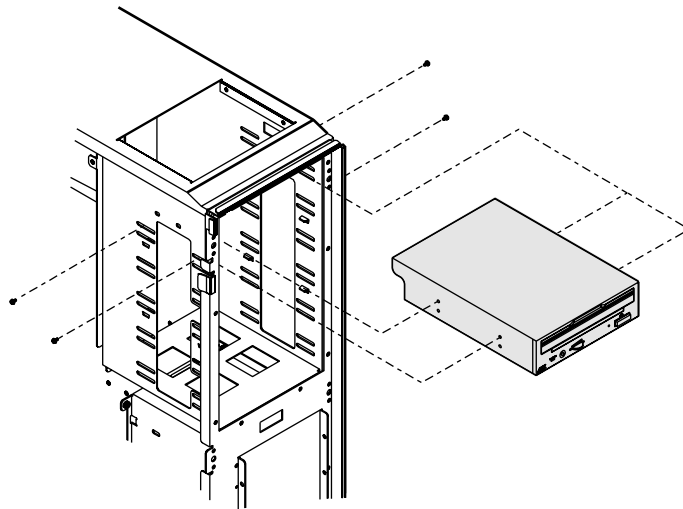
Figure 19: Installing a 5.25-inch Drive

6. Place the new 5.25-inch drive in the chassis and secure the drive to the chassis using the screws you removed in Step 5.

7. Connect the power and data cables to the back of the drive. (See drive documentation for proper drive jumper settings and cable orientation.)

8. Close the case, as described in "Closing the system" on page 7.

9. Reconnect the power cord and turn on the system.

10. Run the configuration software, if required.

Replacing a 3.5-inch drive in the top drive bay

Above the 3.5-inch diskette drive, there is a single bay for an internal 3.5-inch hard drive. This drive can be either IDE or SCSI.

To Replace the 3.5-inch Drive in the Top Drive Bay

1. Turn off the system and disconnect the power cord.

2. Open the case, observing the ESD precautions in "Static electricity precautions" on page 2.

3. Disconnect the data and power cables from the drive in the top drive bay.

4. Remove the two screws that secure the right side of the drive to the chassis and the two screws that secure the bracket to the left side of the 5.25-inch drive cage (see Figure 20).
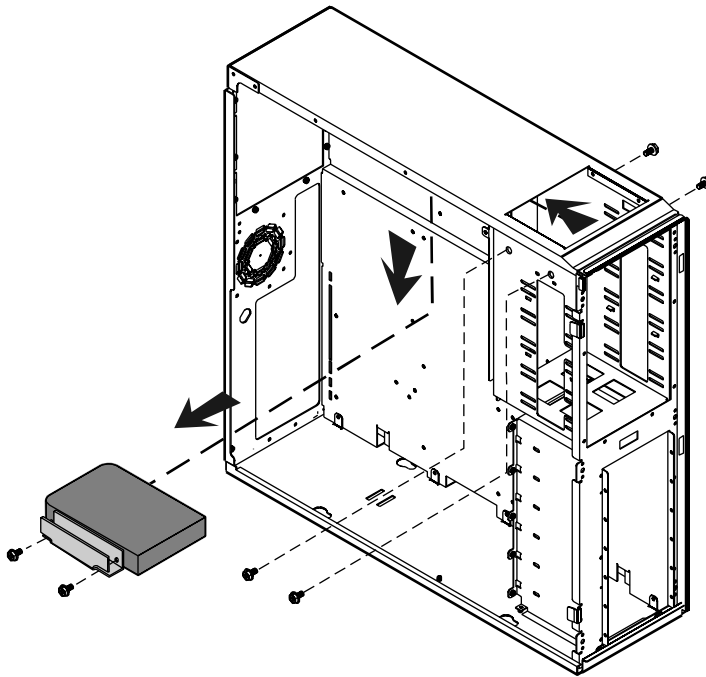
Figure 20: Removing the 3.5-inch Drive from the Top Drive Bay

5. Remove the bracket from the left side of the old drive by removing the two screws.

6. Secure the bracket to the left side of the new drive, using the two screws you just removed (see Figure 21).
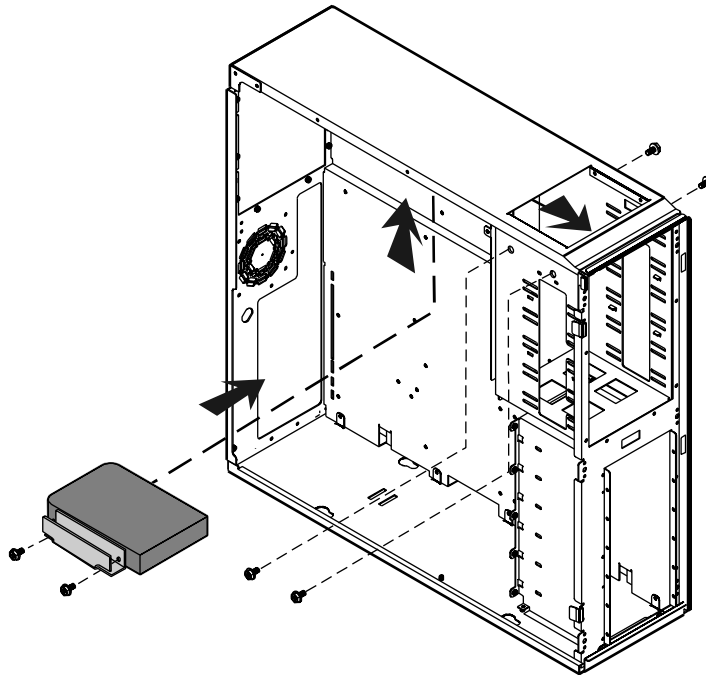
Figure 21: Replacing the 3.5-inch Drive in the Top Drive Bay

7. Place the new drive and bracket in the top drive bay and secure them with the four screws you removed earlier.

8. Connect the data and power cables to the new drive, being careful to orient them correctly.

9. Close the case and turn the server on.

Replacing a RAID drive

The hard drives in the RAID bay are secured to guide rails, which lets you install and remove the drives from the system chassis. Use this procedure for the SCA SCSI drives installed in the RAID bay, not the 3.5-inch drive bay at the back of the chassis. The RAID bay supports up to six 3.5-inch LVD SCA SCSI hard drives

To Replace a RAID Drive

1. Unlock and open the lower bezel door.

2. Locate the SCA hard disk that you want to replace.

3. Pull the release latches on the guide rails outward to release the drive from the RAID bay (see Figure 22).
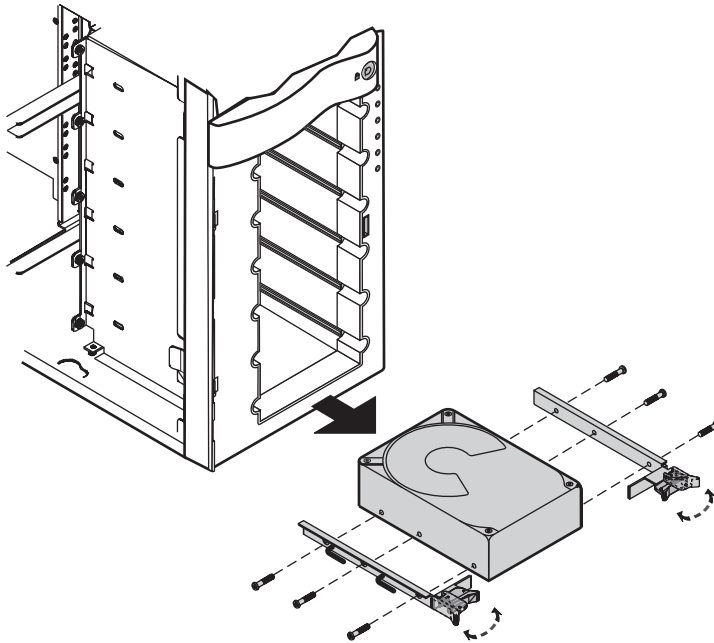
Figure 22: Removing an SCA Drive

4. Pull the drive straight out of the bay.

5. Remove the replacement drive from its protective cover and align the guide rails with the RAID bay guides.

6. Slide the drive into the bay until the connector makes contact with the SCA connector on the backplane (see Figure 23).
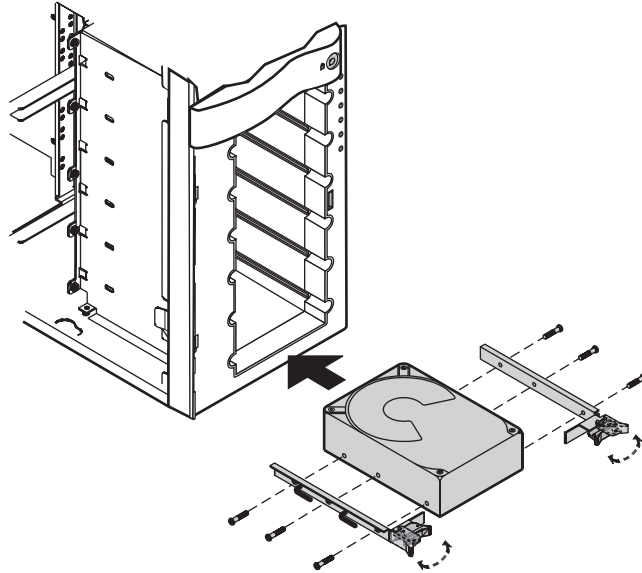
Figure 23: Installing an SCA Drive

7. Press the drive in firmly until the connector seats securely. Press the latches inward until they click into place to seat the drive securely in the bay.

8. Close the lower bezel door and lock it.

SCSI cable kit installation

The following section describes how to install the SCSI cable kit from the integrated onboard SCSI connector on the system board to the rear panel of the chassis.

The following tools are required to complete the installation:

- Phillips screwdriver
- Straight blade screwdriver
- Anti-static wristband

To install the SCSI cable kit:

1. Power down the system and remove the power cord(s).

2. Remove the parts from the SCSI Cable Kit.

3. Remove the two screws from the rear of the left side cover.

4. Slide the side cover back slightly, then lift it out and off.

5. Using the straight bladed screwdriver, remove the punchout section (insert the blade of the screwdriver into the slot in the punchout, then pry back and fourth until loose).
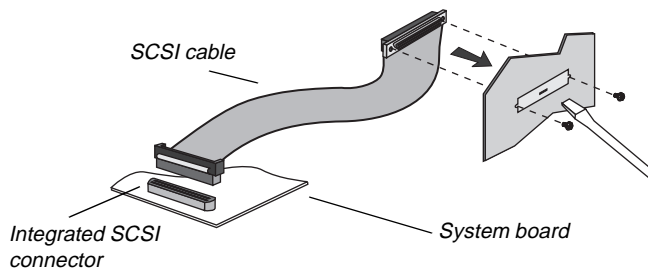
Figure 24: Installing the SCSI Cable Kit

6. One end of the SCSI cable is attached to a bracket containing two threaded holes. From the inside of the system, hold this end of the cable up to the opening created when the punchout was removed.

7. Using the two small screws included in the SCSI Cable Kit, secure the SCSI cable/bracket to the rear panel of the chassis.

8. Plug the other end of the SCSI cable into the appropriate SCSI connector on the system board.

9. Arrange the ribbon cable so that it doesn't interfere with chassis or CPU fans, or block airflow through the system.

10. Reinstall the left side cover of the system and replace the two screws.

11. Plug in the system power cord(s) and power up the system.

Adding an expansion card

The system board has eight (8) expansion slot connectors. The system board accepts two types of expansion cards: ISA and PCI. Some of the PCI expansion slots are designed to allow the slot to be shared with a special purpose expansion card such as a RAID port card.

Some ISA expansion cards have jumpers or switches that set interrupts and I/O addresses. They come with instructions that explain how to set them to avoid hardware conflicts. Follow the instructions carefully.

Refer to Figure 7 on page 12 for the correct installation location.

To Install an Expansion Card

1. Set any jumpers and switches on the card as required in the card instructions.

2. Turn off the system and disconnect the power cord.

3. Open the case, observing the ESD precautions in "Static electricity precautions" on page 2.

4. Locate an available slot.

5. Remove and retain the screw securing the expansion port cover to the rear panel. Keep the port cover for reinstallation in case you ever need to remove the card.

6. Firmly insert the edge of the expansion card into the slot (see Figure 25).
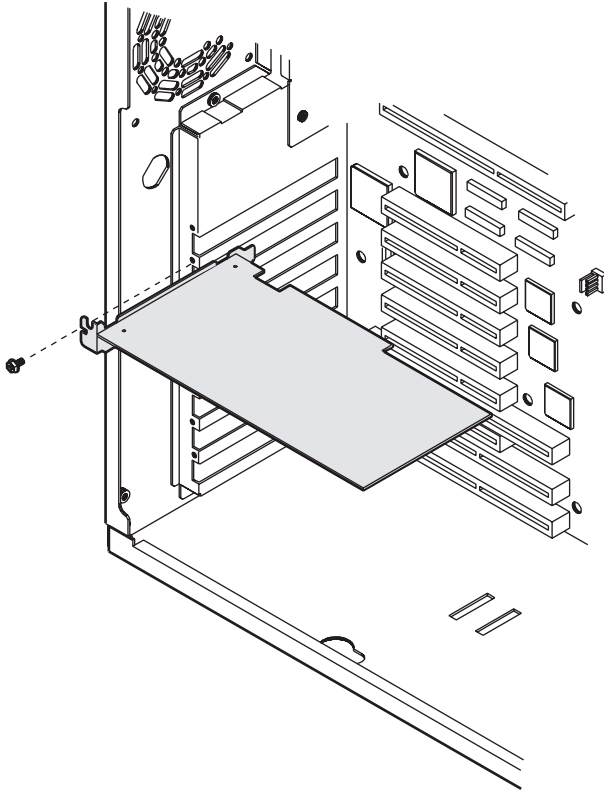
Figure 25: Adding an Expansion Card

7. After seating the card firmly, secure it to the chassis by installing the screw you removed in Step 5 through the mounting bracket at the end of the card.

8. Connect cables to the card. (See the card documentation for proper jumper settings and cable orientation.)

9. Close the case, as described in "Closing the system" on page 7.

10. Reconnect the power cord and turn on the system.

It may be necessary to reconfigure your system after installing some expansion cards. You may also need to install software that came with the card. Check the card documentation for additional information.

Replacing the lithium battery

The lithium battery provides power for the system real-time clock and CMOS RAM, which holds the system configuration information.

To Replace the Battery

1. Restart the computer and start the BIOS Setup program by pressing F1 when you are prompted to do so.

2. Write down the CMOS values from the Main Setup screen so you can re-enter them after you replace the battery. (For more information about the setup program, see "Using the BIOS Setup Utility" on page 54.)

3. Turn off the system and disconnect the power cord.

4. Open the case, observing the ESD precautions in "Static electricity precautions" on page 2.

5. Locate the battery on the system board. The battery is circular and has the positive pole mark (+) on the top, see Figure 7 on page 12.

6. Gently pull the battery from its socket and press the new battery in the socket with the positive pole up. Be sure you have pressed the battery down far enough for it to touch the base of the socket.

7. Close the case, as described in "Closing the system" on page 7.

8. Reconnect the power cord and turn on the system.

9. Enter the BIOS Setup program and verify that the system configuration is correct using the data you recorded in Step 2.

If the CMOS data is not correct, change the information in the Setup screens as necessary.

Troubleshooting the battery installation

If you have problems after installing the new battery, try each of the items listed below, replacing the cover and restarting the computer after each try.

- Turn off the system and ensure that all exterior cables are attached to the correct connectors and secured.

- Check to be sure that all power switches are on. If the system is plugged into a power strip or surge protector, be sure it is turned on also.

- Enter the BIOS Setup program and compare the settings on the screen with your notes or the system hardware manuals. Correct any discrepancies.

- Turn off the system, remove the cover, and verify that all cables inside the case are attached securely. Also, make sure that the colored cable edges are aligned correctly and that the connectors did not miss any pins.

- Turn off the system, remove the cover, and disconnect and reconnect the cables, and then replace the cover carefully so as not to disturb any cables.

- Turn off the system, remove the cover and, if you have the proper test equipment, verify that the new battery has power. (It is possible, although highly unlikely, that the new battery is defective.)

If these procedures fail to correct the problem, contact technical support.

When everything works properly, close the case as described in "Closing the system" on page 7, reconnect the power cord, and turn on the system.

Installing software and drivers

The procedure for installing software and drivers is usually specific to the operating system you will run on the server. Here are some tips.

Installing the USB driver

To use a USB device, you must install the USB driver in a computer running Windows 95. A 3.5-inch disk labeled "Integrated Controller UATA files for Win 95" was shipped with your computer. You must use this disk to install the USB driver.

To Install the USB Driver

1. Start the computer.

2. Put the 3.5-inch disk labeled "Integrated Controller UATA files for Win 95" into the disk drive.

3. Open the **Readme.1st** file and follow the instructions on screen.

After you have installed the USB driver, install the USB device by attaching it to a USB port on the rear panel. Check the device documentation for additional information to see if you must install software for the device.

Installing video drivers

The integrated video controller on the system board uses standard drivers provided with the system utilities diskettes. For those running Windows NT in particular, use the driver provided on the utilities diskettes (Cirrus Logic Windows NT 4.0 diskette) not those provided on the Windows NT installation CD-ROM. The drivers provided on the Windows NT CD-ROM may not function correctly.

Video driver installation varies depending on the operating system that you run on the server. Refer to the documentation for the operating system for specific instructions.

If you use an add-in video controller, the drivers accompany the controller card. See the documentation that accompanied the card for instructions and information regarding the drivers for an add-in video card.

NetWare drivers

Installing second instance driver for NetWare 4.11

When installing the second instance driver for the second SCSI controller, the server will generate interrupts which may hang the server. To resolve this issue, replace the MPS14.PSM file that is installed during the NetWare 4.11 installation with an updated version of the file. The updated file can be obtained from the Netware Service Pack 5 utility patch provided by Novell.

4

BIOS Setup

About the BIOS Setup Utility

The computer BIOS has a built-in program that lets you set many basic system characteristics. These settings are stored and saved even when the power is off. This chapter contains information about this setup utility and is intended to serve as a guide so that you can make changes to the system BIOS when necessary.

Many of the screen examples that you see in this chapter are identical to what you see on your monitor; however, you may have a system with a newer BIOS version than the one described in this manual. In that case, some of the examples may differ somewhat from what you see, but the screens are similar enough that you should have no trouble getting the information that you need.

Using the BIOS Setup Utility

The computer BIOS has a built-in setup utility that lets you configure several basic system characteristics. The settings are stored in battery-backed RAM and are retained even when the power is off.

To enter the Setup utility, restart the system and then press F1 when prompted on screen during the startup process.

The lower section of all screens provides information about keystrokes necessary to access help, navigate through the menus, and perform other functions.

F1 Help	↑↓ Select Item	+/- Change Values	F9 Setup Defaults
ESC Exit	←→ Select Menu	ENTER Select ▶ Sub-Menu	F10 Save and Exit

Figure 26: BIOS Menu Navigation Keystrokes

- **Help** – Press F1 to get information about the selected item. This item is only usable in a submenu.

- **Back** – Press Esc to back out of any field.

- **Next and Previous Item** – Press the up arrow or down arrow keys to move to the next or previous menu item.

- **Select Menu** – Use the left arrow and right arrow keys to move between the six main menus (Main, Advanced, Security, Boot and Exit).

- **+/- Change Values** – Press the + or - key to toggle through the available options for the selected item.

- **ENTER Select Sub-Menu** – Pressing ENTER when a sub-menu is highlighted takes you to that sub-menu.

- **Setup Defaults** – Press F9 to set the setup parameters to their factory default values. A dialog box appears, asking you to press either ENTER to load the defaults or ESC to skip.

- **Save & Exit** – Press F10 to exit the setup utility and either save or ignore all changes. A dialog box appears, asking you to press ENTER to save the changes or ESC to ignore the changes and exit.

Main menu screen

Upon entering Setup, the Main menu screen opens. The main menu screen allows you to access the most common Setup fields.

```
                        PhoenixBIOS Setup Utility

    MAIN     ADVANCED     SECURITY     BOOT     EXIT
                                                      Item Specific Help

    System Time:              [12:00:00]
    System Date:              [07/01/1998]
                                                      (Refer to each
    Legacy Diskette A:        [1.44/1.25MB, 3 1/2"]   parameter for
    Legacy Diskette B:        [1.2 MB, 5 1/4"]        specific Help
                                                      messages.)
  ▶ Primary Master:           [None]
  ▶ Primary Slave:            [None]
  ▶ Secondary Master:         [None]
  ▶ Secondary Slave:          [None]


    System Memory:            640 KB
    Extended Memory:            7 MB




  F1 Help       ↑↓  Select Item     +/- Change Values        F9 Setup Defaults
  ESC Exit      ←→ Select Menu      ENTER Select▶ Sub-Menu    F10 Save and Exit
```

Figure 27: Main Menu Screen

- **System Time:** lets you set the system time. Use a twenty-four hour clock and the format HH:MM:SS.

- **System Date:** lets you set the system date. Use the format MM/DD/YYYY

- **Legacy Diskette A:** allows you to select the type of diskette drive installed as drive A. The options are **360 kB, 5 ¼"; 1.2 MB, 5 ¼"; 720 kB, 3 ½"; 1.44/1.25 MB, 3 ½";2.88 MB, 3 ½"; NOT INSTALLED;** and **DISABLED**.

- **Legacy Diskette B:** allows you to select the type of diskette drive installed as drive B. The options are **360 kB, 5 ¼"; 1.2 MB, 5 ¼"; 720 kB, 3 ½"; 1.44/1.25 MB, 3 ½";2.88 MB, 3 ½"; NOT INSTALLED;** and **DISABLED**.

- **Primary Master:** opens the Primary Master screen to permit you to setup the primary master hard disk drive. Details of this screen are provided in the section "Hard disk drive setup screen" on page 57.

- **Primary Slave:** opens the Primary Slave screen to permit you to setup the primary slave hard disk drive. Details of this screen are provided in the section "Hard disk drive setup screen" on page 57.

- **Secondary Master:** opens the Secondary Master screen to permit you to setup the secondary master hard disk drive. Details of this screen are provided in the section "Hard disk drive setup screen" on page 57.

- **Secondary Slave:** opens the Secondary Slave screen to permit you to setup the secondary slave hard disk drive. Details are provided in the section "Hard disk drive setup screen" on page 57.

- **System Memory:** shows the amount of base system memory detected. This field is for reference only.

- **Extended Memory:** shows the amount of extended memory detected. This field is for reference only.

Hard disk drive setup screen

The hard disk drive setup screen appears whenever the **Primary Master, Primary Slave, Secondary Master,** or **Secondary Slave** fields are selected from the main menu screen.

```
                          PhoenixBIOS Setup Utility

              Primary Master                    Item Specific Help

     Type:                     [Auto]                (Refer to each
                                                     parameter for
     Multi-Sector Transfers:   [Enabled]             specific Help
     LBA Mode Control:         [Enabled]             messages.)
     32 Bit I/O:               [Enabled]
     Transfer Mode:            [Standard]
     Ultra DMA Mode:           [Enabled]

 F1 Help      ↑↓  Select Item     +/- Change Values        F9 Setup Defaults
 ESC Exit     ←→  Select Menu     ENTER Select ▶ Sub-Menu  F10 Save and Exit
```
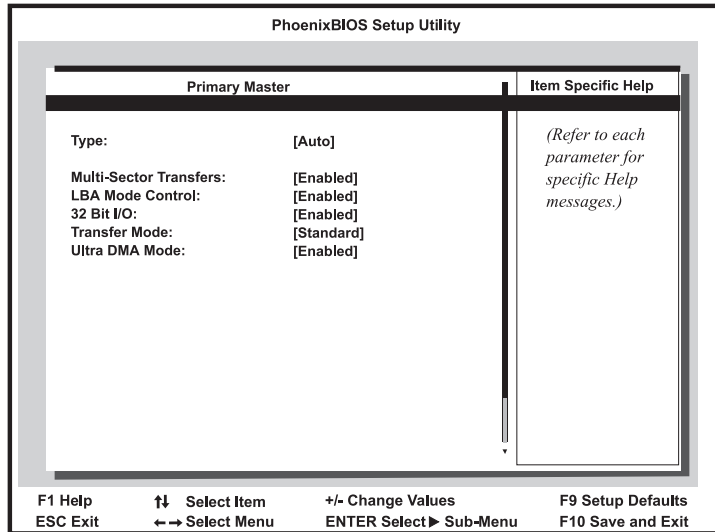
Figure 28: Example Hard Disk Drive Setup Screen

- **Type** offers the following options:
  - **1 to 39** - Selecting this options brings up one of a set of previously defined drive types and sizes. These values only apply to older drives, generally less than 200-MB in size.
  - **User** - Selecting this option brings up a sub-menu where you can enter the **CYLINDERS, HEADS, SECTORS** and **MAXIMUM CAPACITY** of the drive you are configuring. These values are generally available from the documentation for the drive or the drive label itself.
  - **Auto** - Selecting this option automatically configures the drive based on information from the drive itself.
  - **CD-ROM** - Select this option if the drive is a CD-ROM.
  - **IDE Removable** - Select this option of the drive is a removable disk drive.

- **ATAPI Removable -** Select this option if the drive is an ATAPI removable disk drive.

- **None -** "Auto" has been unable to supply the drive type or select "None" to disable any drive installed.

- **Multi-Sector Transfers:** enabling this option allows multiple sector data transfers on compatible drives. The options are **DISABLED, STANDARD, 2 SECTORS, 4 SECTORS, 8 SECTORS,** and **16 SECTORS**.

- **LBA Mode Control:** enabling this option causes Logical Block Addressing to be used in place of Cylinders, Heads and Sectors. The options are **ENABLED** and **DISABLED**.

- **32 Bit I/O:** enabling this option allows 32-bit communication between the processor and the IDE controller. The options are **ENABLED** and **DISABLED**.

- **Transfer Mode:** selects the method for moving data to and from the drive. The options listed are those supported by the drive and the platform; either **STANDARD, FAST PIO 1, FAST PIO 2, FAST PIO 3,** and **FAST PIO 4**; or **STANDARD, FAST DMA A, FAST DMA B**, and **FAST DMA F**.

- **Ultra DMA Mode:** enabling this option allows a faster data transfer rate with compatible drives. The options are **ENABLED** and **DISABLED**.

Advanced menu screen

The advanced menu screen allows you to access a large number of advanced features. Many of these features can cause the system to malfunction if set incorrectly. Do not change these settings unless you must.

```
                         PhoenixBIOS Setup Utility

      MAIN    ADVANCED   SECURITY    BOOT    EXIT
                                                        Item Specific Help

                                                         (Refer to each
                                                         parameter for
      Plug & Play O/S:                [Yes]              specific Help
      Reset Configuration Data:       [No]               messages.)
      Use Multiprocessor Specification: [1.4]

      Large Disk Access Mode:         [DOS]
      Local Bus IDE Adapter:          [Both]

    ▶ Resource Configuration:
    ▶ Peripheral Configuration:
    ▶ Keyboard Features:
    ▶ Cache Memory:
    ▶ Advanced  Chipset Control:

      Embedded PCI SCSI: Channel A:   [Enabled]
      Embedded PCI SCSI: Channel B:   [Enabled]
      Embedded PCI NIC:               [Enabled]
      SHM Address                     [1]


    F1 Help       ↑↓  Select Item      +/- Change Values      F9 Setup Defaults
    ESC Exit      ←→  Select Menu      ENTER Select ▶ Sub-Menu  F10 Save and Exit
```

Figure 29: Advanced Menu Screen

- **Plug and Play O/S:** specifies whether the operating system is compatible with Plug and Play. The options are **Yes** and **No**.

- **Reset Configuration Data:** selecting **Yes** causes the system to clear its configuration data and automatically configure all PnP devices at bootup. Selecting **No** causes the system to use the existing configuration information. this field automatically resets itself to **No** at the next system boot.

- **Use Multiprocessor Specification:** this field configures the multiprocessor specification used to coordinate between multiple processors. Specification 1.4 allows extended bus definitions and is required to permit a secondary PCI bus to work without a bridge. The system board is compatible with both specifications.

- **Large Disk Access Mode:** options are **DOS** and **Other**. Select **DOS** if you use DOS or one of the DOS-based operating systems. Select **Other** if you use another operating system such as UNIX. A large disk is considered one that has more than 1024 cylinders, 16 heads, or 63 tracks per sector.

- **Resource Configuration** opens the resource configuration screen. Details of this screen are provided in the section, "Resource configuration screen" on page 61.

- **Peripheral Configuration** opens the peripheral configuration screen. Details of this screen are provided in the section, "Peripheral configuration screen" on page 64.

- **Keyboard Features** opens the keyboard configuration screen. Details of this screen are provided in the section "Keyboard features screen" on page 65.

- **Cache Memory** opens the cache memory configuration screen. Details of this screen are provided in the section "Cache memory screen" on page 66.

- **Advanced Chipset Control** opens the advanced chipset control screen which contains a single field. The field is **ECC Config**, which allows you to set the extent of error checking and correction that the system uses. The options for this field are **Disabled, EC, ECC,** and **ECC Scrub.**

- **Embedded PCI SCSI: Channel A** enabling this field turns on channel A of the integrated SCSI adapter. Set the Scan First option if booting from a hard disk and the Scan Last option if booting from a CD-ROM. The options are **Enabled** and **Disabled**.

- **Embedded PCI SCSI: Channel B** enabling this field turns on channel B of the integrated SCSI adapter. Set the Scan First option if booting from a hard disk and the Scan Last option if booting from a CD-ROM. The options are **Enabled** and **Disabled**.

- **Embedded PCI NIC:** enabling this field turns on the integrated network interface controller. The options are **Enabled** and **Disabled**.

- **SHM Address**: defines the system hardware manager (SHM) address. The options are 1 through 7.

Resource configuration screen

This screen appears whenever **Resource Configuration** is selected from the advanced menu.

```
                    PhoenixBIOS Setup Utility

        Resource Configuration                   Item Specific Help

     ▶ Memory Reservation                        (Refer to each
     ▶ IRQ Reservation                           parameter for
                                                  specific Help
                                                  messages.)




  F1 Help      ↑↓ Select Item      +/- Change Values      F9 Setup Defaults
  ESC Exit     ←→ Select Menu      ENTER Select ▶ Sub-Menu  F10 Save and Exit
```
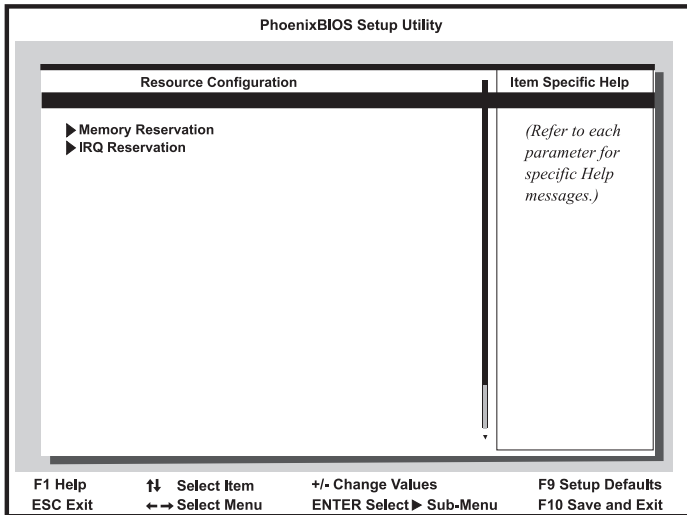
Figure 30: Resource Configuration Screen

- **Memory Reservation:** opens the memory reservation screen. This screen allows you to reserve blocks of upper memory for use by legacy ISA devices. Details of this screen are provided in the section "Memory reservation screen" on page 62.

- **IRQ Reservation:** opens the IRQ reservation screen. This screen allows you to reserve IRQs for use by legacy ISA devices. Details of this screen are provided in the section "IRQ reservation screen" on page 63.

★ *Important!*

The SHM Address is always 1 in stand-alone configurations.

Memory reservation screen

This screen appears whenever you select **Memory Reservation** from the resource configuration screen. It allows you to reserve a block of memory for ISA devices.
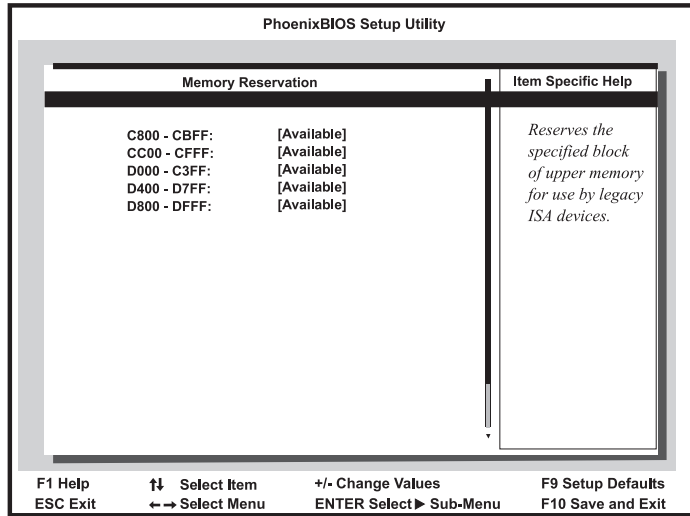


```
                    PhoenixBIOS Setup Utility

              Memory Reservation            │   Item Specific Help


        C800 - CBFF:      [Available]           Reserves the
        CC00 - CFFF:      [Available]           specified block
        D000 - C3FF:      [Available]           of upper memory
        D400 - D7FF:      [Available]           for use by legacy
        D800 - DFFF:      [Available]           ISA devices.




    F1 Help          ↑↓  Select Item      +/- Change Values        F9 Setup Defaults
    ESC Exit         ←→ Select Menu       ENTER Select ▶ Sub-Menu  F10 Save and Exit
```

Figure 31: Memory Reservation Screen

- **XXXX - XXXX:** you may reserve the specified area of upper memory for use by legacy ISA devices. The options for each memory region are **Available** and **Reserved**.

IRQ reservation screen

This screen appears whenever you select **IRQ Reservation** from the advanced menu. It allows you to manually reserve IRQs for specific devices.
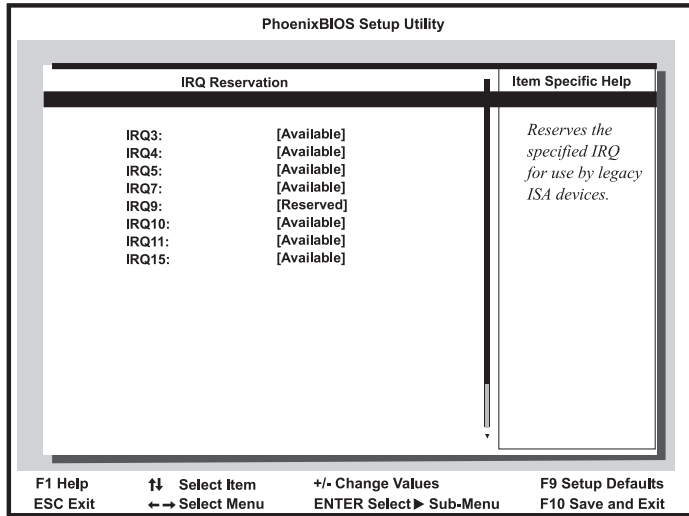
```
                        PhoenixBIOS Setup Utility

              IRQ Reservation                    Item Specific Help

         IRQ3:          [Available]              Reserves the
         IRQ4:          [Available]              specified IRQ
         IRQ5:          [Available]              for use by legacy
         IRQ7:          [Available]              ISA devices.
         IRQ9:          [Reserved]
         IRQ10:         [Available]
         IRQ11:         [Available]
         IRQ15:         [Available]




    F1 Help       ↑↓  Select Item      +/- Change Values        F9 Setup Defaults
    ESC Exit      ← → Select Menu      ENTER Select ► Sub-Menu   F10 Save and Exit
```

Figure 32: IRQ Reservation Screen

- **IRQx:** you may reserve the specified IRQ for use by legacy ISA devices. The options for each IRQ are **Available** and **Reserved**.

Peripheral configuration screen

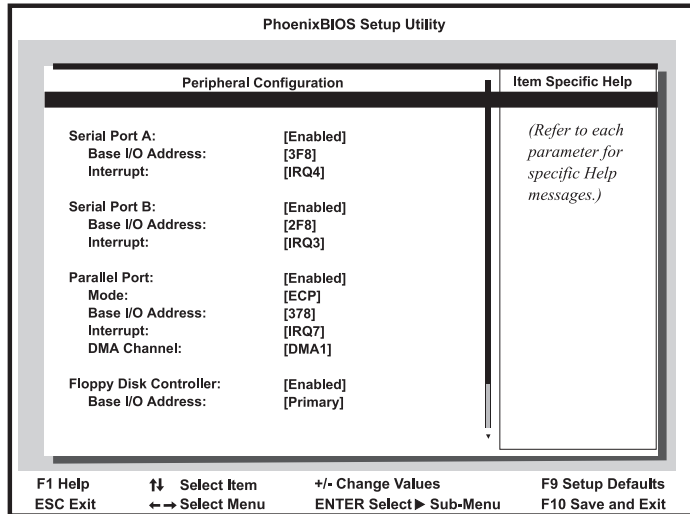This screen allows you to configure the system peripherals.

```
                      PhoenixBIOS Setup Utility

              Peripheral Configuration          │  Item Specific Help

                                                    (Refer to each
    Serial Port A:                 [Enabled]        parameter for
        Base I/O Address:          [3F8]            specific Help
        Interrupt:                 [IRQ4]           messages.)

    Serial Port B:                 [Enabled]
        Base I/O Address:          [2F8]
        Interrupt:                 [IRQ3]

    Parallel Port:                 [Enabled]
        Mode:                      [ECP]
        Base I/O Address:          [378]
        Interrupt:                 [IRQ7]
        DMA Channel:               [DMA1]

    Floppy Disk Controller:        [Enabled]
        Base I/O Address:          [Primary]


    F1 Help      ↑↓  Select Item      +/- Change Values      F9 Setup Defaults
    ESC Exit     ←→ Select Menu     ENTER Select ▶ Sub-Menu  F10 Save and Exit
```

Figure 33: Peripheral Configuration Screen

- **Serial Port A:** the options include **Enabled, Disabled,** and **Auto**.

    - **Base I/O Address:** displays the base I/O address for serial port A. Use the "+" or "-" key to display the optional addresses available.

    - **Interrupt:** displays the current interrupt for serial port A. Use the "+" or "-" key to display the optional interrupts available.

- **Serial Port B:** the options include **Enabled, Disabled,** and **Auto**.

    - **Base I/O Address:** displays the base I/O address for serial port B. Use the "+" or "-" key to display the optional addresses available.

    - **Interrupt:** displays the current interrupt for serial port B. Use the "+" or "-" key to display the optional interrupts available.

- **Parallel Port:** the options include **Enabled, Disabled,** and **Auto**.

    - **Mode:** displays the current parallel port mode. The options include **ECP** (extended capabilities port), **Bi-directional,** and **Output only**.

- **Base I/O Address:** displays the base I/O address for the parallel port. Use the "+" or "-" key to display the optional addresses available.

- **Interrupt:** displays the current interrupt for the parallel port. Use the "+" or "-" key to display the optional interrupts available.

- **DMA Channel:** displays the current DMA channel used by the parallel port. Use the "+" or "-" key to display the optional DMA channels available.

- **Floppy Disk Controller:** this field controls the integrated diskette drive controller. The options include **Enable** and **Disable**.

  - **Base I/O Address:** sets the base I/O address used by the controller. The options include **Primary** and **Secondary**.

Keyboard features screen

This screen allows you to configure the features of the keyboard.

```
                        PhoenixBIOS Setup Utility

              Keyboard Features                    Item Specific Help

     Num Lock:                  [On]              (Refer to each
     Key Click:                 [Disabled]        parameter for
     Keyboard Auto-Repeat Rate: [30/sec]          specific Help
     Keyboard Auto-Repeat Delay:[1/2 sec]         messages.)

     F1 Help      ↑↓ Select Item    +/- Change Values      F9 Setup Defaults
     ESC Exit     ←→ Select Menu    ENTER Select ▶ Sub-Menu  F10 Save and Exit
```
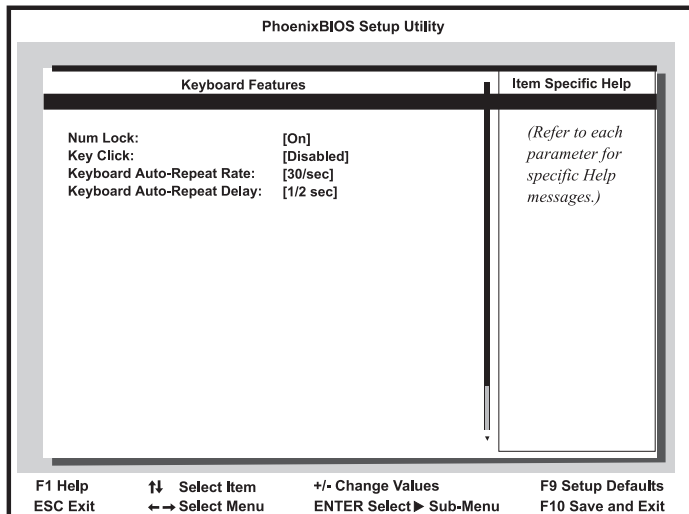
Figure 34: Keyboard Features Screen

- **Num Lock:** sets the power-on state of the NUMLOCK key. The options include **Auto, On,** and **Off**.

- **Key Click:** enable causes an audible click when each key is pressed. The options are **Enable** and **Disable**.

- **Keyboard Auto-Repeat Rate:** determines the rate at which a character repeats if a key is held down. The options are **2/sec, 6/sec, 10/sec, 13.3/sec, 18.5/sec, 21.8/sec, 26.7/sec**, and **30/sec**.

- **Keyboard Auto-Repeat Delay:** determines the amount of delay before a pressed key repeats. The options are **1/2 sec, 3/4 sec**, and **1 sec**.

Cache memory screen

This screen allows you to configure various aspects of the system cache memory.


```
                        PhoenixBIOS Setup Utility

            Cache Memory                              Item Specific Help

  Memory Cache:                    [Enabled]          (Refer to each
  Cache System BIOS area:          [Write Protect]    parameter for
  Cache Video BIOS area:           [Write Protect]    specific Help
  Cache Base 0-512K:               [Write Back]       messages.)
  Cache Base 512K-640K:            [Write Back]
  Cache Extended Memory area:      [Write Back]

  Cache C800 - CBFF                [Enabled]
  Cache CC00 - CFFF                [Enabled]
  Cache D000 - D3FF                [Enabled]
  Cache D400 - D7FF                [Enabled]
  Cache D800 - DBFF                [Enabled]
  Cache DC00 - DFFF                [Enabled]

  F1 Help      ↑↓  Select Item      +/- Change Values          F9 Setup Defaults
  ESC Exit     ←→  Select Menu      ENTER Select ▶ Sub-Menu     F10 Save and Exit
```

Figure 35: Cache Memory Screen

- **Memory Cache:** normally used to troubleshoot speed-related problems. The options include **Enable** and **Disable**.

- **Cache System BIOS Area:** controls the caching of the system BIOS area. The options are **Uncached** and **Write Protect**.

- **Cache Video BIOS Area**: controls the caching of the video BIOS area. The options are **Uncached** and **Write Protect**.

- **Cache Base 0-512K:** controls caching of the first 512K of base memory. The options are **Write Back, Write Through,** and **Uncached**.

- **Cache Base 512K-640K:** controls caching of the 512K through 640K area of base memory. The options are **Write Back, Write Through,** and **Uncached**.

- **Cache Extended Memory Area:** controls the caching of the system memory above 1 MB. The options are **Enabled** and **Disabled**.

- **Cache segments (for example, C800 - CBFF):** controls the caching of specified segments of memory. The options are **Enabled** and **Disabled**.

Security menu screen

This screen allows you to set system security characteristics.

```
                    PhoenixBIOS Setup Utility

  MAIN      ADVANCED    SECURITY    BOOT     EXIT
                                                  Item Specific Help

      Supervisor Password:       [Clear]
      User Password:             [Clear]          (Refer to each
                                                  parameter for
      Set Supervisor Password:   [Enter]          specific Help
      Set User Password:         [Enter]          messages.)

      Password on Boot:          [Enabled]
      Fixed Disk Boot Sector:    [Normal]
      Diskette Access:           [User]




  F1 Help      ↑↓  Select Item    +/- Change Values      F9 Setup Defaults
  ESC Exit     ←→  Select Menu    ENTER Select ▶ Sub-Menu  F10 Save and Exit
```

Figure 36: Security Menu Screen

- **Supervisor Password:** displays the status of the supervisor password. The options are **Clear** (no password entered) and **Set** (a password has been established). You cannot set this field directly.

- **User Password:** displays the status of the user password. The options are **Clear** (no password entered) and **Set** (a password has been established). You cannot set this field directly.

- **Set Supervisor Password**: opens the supervisor password dialog box. In this box, the supervisor can enter and verify the password used to control access to the Setup utility. If the supervisor password has already been set, the supervisor must enter the current password before entering and verifying the new password.

- **Set User Password**: opens the user password dialog box. In this box, you can enter and verify the password used to control access to the system. If the user password has already been set, you must enter the current password before you enter and verify the new password.

- **Password on Boot:** when this option is enabled, the system prompts you for a password before booting the system. The options are **Enable** and **Disable**.

- **Fixed Disk Boot Sector:** this field protects the boot sector from viruses. The options are **Normal** and **Write Protect.**

- **Diskette Access:** controls access to the diskette drive. The options include **Supervisor** (diskette drive is accessible only to the supervisor) and **User** (diskette drive is accessible to the user).

Boot menu screen

This screen allows you to set the order in which the system seeks boot data.

```
                    PhoenixBIOS Setup Utility

   MAIN    ADVANCED    SECURITY    BOOT    EXIT
                                              Item Specific Help

     First Boot Device:        [Diskette Drive]
     Second Boot Device:       [Hard Drive]          (Refer to each
     Third Boot Device:        [Removable Devices]   parameter for
     Fourth Boot Device:       [ATAPI CD-ROM Drive]  specific Help
     Fifth Boot Device:        [Network Boot]        messages.)



   ▶ Hard Drive:
   ▶ Removable Devices:






   F1 Help        ↑↓  Select Item      +/- Change Values      F9 Setup Defaults
   ESC Exit       ←→  Select Menu      ENTER Select ▶ Sub-Menu  F10 Save and Exit
```

Figure 37: Boot Menu Screen

- **First Boot Device:** designates the device that the system polls first upon boot up. The options include **Diskette Drive, Hard Drive, Removable Devices, ATAPI CD-ROM Drive,** and **Network Boot**.

- **Second Boot Device:** designates the device that the system polls second upon boot up, if the previous device is not ready or contains no boot data. The options include **Diskette Drive, Hard Drive, Removable Devices, ATAPI CD-ROM Drive,** and **Network Boot**.

- **Third Boot Device:** designates the device that the system polls third upon boot up, if the previous device is not ready or contains no boot data. The options include **Diskette Drive, Hard Drive, Removable Devices, ATAPI CD-ROM Drive,** and **Network Boot**.

- **Fourth Boot Device:** designates the device that the system polls fourth upon boot up, if the previous device is not ready or contains no boot data. The options include **Diskette Drive, Hard Drive, Removable Devices, ATAPI CD-ROM Drive,** and **Network Boot**.

- **Fifth Boot Device:** designates the device that the system polls fifth upon boot up, if the previous device is not ready or contains no boot data. The options include **Diskette Drive, Hard Drive, Removable Devices, ATAPI CD-ROM Drive,** and **Network Boot**.

- **Hard Drive:** displays a list of the available hard drives. The system attempts to boot to the operating system from the first hard drive on this list. If no operating system is found, the system tries the next drive listed until an operating system is found. Use the up and down arrows to select a device, then press (+) or (-) to move it up or down the list.

- **Removable Devices:** displays a list of the available removable media devices. The system assigns drive letters to these devices in the order displayed. To change the sequence and drive letter of a device, use the up and down arrows to select a device, then press (+) or (-) to move it up or down the list.

Exit menu screen

This screen allows you to exit the Setup program or to save any changes you have made to the BIOS settings.
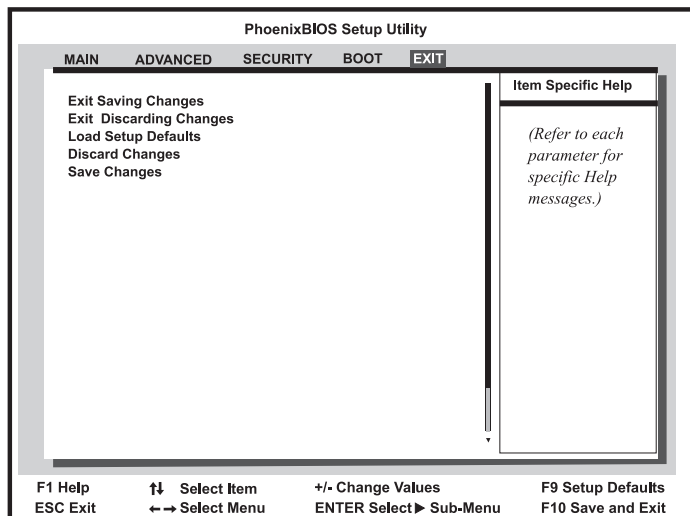
Figure 38: Exit Menu Screen

- **Exit Saving Changes:** exits BIOS Setup and saves the changes you have entered in the CMOS memory . The next time you boot the system, the BIOS configures the system using these settings.

- **Exit Discarding Changes:** exits BIOS Setup and discards the settings you have entered. The next time you boot the system, the BIOS configures the system using the old settings.

- **Load Setup Defaults:** displays the Setup defaults in cases where the settings have been corrupted or incorrectly modified. Press F1 to resume the boot, or F2 to run BIOS Setup with the ROM default values already loaded into the menus.

- **Discard Changes:** restores the CMOS settings previously entered (not the default values) and discards the changes entered in the current session, without exiting BIOS Setup.

- **Save Changes:** saves the changes you have made during the current session, without exiting Setup.

Updating the BIOS

Flash memory simplifies distributing BIOS upgrades. If you need a new version of the BIOS, you can download the BIOS update from the technical support web site and install the new version from a diskette.

<div align="center">

To Update the BIOS

</div>

1. Enter BIOS Setup by pressing F1 when prompted during startup.

2. Write down the settings for each of the parameters. (At the end of the BIOS update process, reset the parameters to the correct values.)

3. Exit the BIOS Setup program.

4. Download the correct BIOS file from the technical support web site. Directions are provided on the website.

5. Uncompress the contents of the BIOS file you downloaded and copy the contents onto a bootable disk.

6. Verify that drive A is the first boot device or set it to be the first boot device (see "Boot menu screen" on page 69).

7. Place the bootable disk containing the BIOS files into drive A, then restart the system with the disk in the drive. The BIOS Setup program starts.

8. Press ENTER to go to the Main menu.

9. Select **Update Flash Memory From a File** and press ENTER.

10. Select **Update System BIOS** and press ENTER.

11. Press TAB to select the file name, then press ENTER.

    The system warns you that BIOS is about to be changed.

12. Press ENTER.

13. Once the BIOS files have been loaded, remove the disk from drive A, then press ENTER when prompted to restart the system.

14. As the system starts up, verify that you have loaded the correct BIOS version.

15. Enter BIOS Setup by pressing F1 when prompted during startup. Once in BIOS Setup, press F5 and then re-enter the values you wrote down at the beginning of this process.

If you do not set the CMOS values back to the defaults using the F5 key or the correct values from your earlier configuration, the system may function erratically.

You may encounter a CMOS checksum error or other problem after the system restarts. If so, try turning the system off and then restarting. CMOS checksum errors require that you enter BIOS Setup, check your settings, save your settings, and exit setup.

5

Troubleshooting

Introduction

If the system does not operate correctly, re-read the instructions for the procedure(s) you have performed and verify that you performed the procedure correctly and completely. If an error occurs in an application, consult the documentation supplied with the software.

This section identifies some solutions to common problems. If the suggestions in this chapter do not resolve your problem, call technical support.

Computer virus notice

A virus is a program written with malicious intent for the sole purpose of creating havoc in a computer system. It attaches itself to executable files or boot sectors, so it can replicate and spread. Some viruses may only cause the system to beep or display messages or images on the screen. Other viruses are highly destructive and corrupt or erase the contents of files or disks. To be safe, never assume any virus is harmless.

Viruses are identified by how they infect the computer.

- **Program Viruses** infect executable program files such as.COM,.EXE, .OVL, .DRV, .SYS, and .BIN.
- **Macro Viruses** infect the data files of specific programs. These viruses are written in the macro languages certain applications use to enhance their functionality. These viruses do not infect other programs or the boot sector.
- **Boot Viruses** attach themselves to a Boot Record, Master Boot, FAT, or Partition Table.
- **Multipartite Viruses** are both program and boot infectors.

Viruses are inactive until the infected program is executed, or a boot record is read. Thereafter, the virus loads itself into system memory and begins to copy and spread itself. Diskettes used in a contaminated system can get infected and, in turn, transfer the virus when used in another system. A virus can also spread via programs downloaded from bulletin boards or the Internet.

<div style="background:#001a99;color:#fff;text-align:center;padding:6px;">To Prevent Virus Infection</div>

- Obtain an anti-virus program and make it a habit to scan the system regularly.

- Make backup copies of all files and write-protect the disks.

- Obtain all software from reputable sources and always scan new software for any viruses prior to installing files.

If the system has been infected, find and remove the viruses using an anti-virus program. Then turn off the system for a minimum of 15 seconds to clear the virus from system RAM. You may want to rerun the anti-virus software when you turn the system back on the verify that the system is clean.

Troubleshooting checklist

Before turning on the system, make sure that:

- The power cord is connected to the AC power-in connector and an AC outlet.

- The AC outlet is supplying power.

- If you use a power strip, make sure it is turned on, and the circuit breaker is set.

- The voltage selection switch on the system power supply reflects the proper voltage.

Verifying the configuration

If the system is not operating correctly, the BIOS may contain an invalid configuration parameter. Enter the BIOS Setup program and check the configuration settings. Lost or incorrect Setup settings may mean a failed battery.

Troubleshooting guidelines

As you troubleshoot the system, follow these guidelines:

- Never remove the system cover while the system is turned on.

- Do not attempt to open the monitor; it is extremely dangerous. Even if the monitor power is disconnected, stored energy in the monitor components can cause a painful or harmful shock.

- If a peripheral such as the keyboard, mouse, drive, or printer does not appear to work, verify that all of the connections are secure.

- If the system displays an error message on the screen, write it down word-for-word. You may be asked for it when calling technical support.

- Only qualified personnel should open the system for maintenance.

- If you are qualified to maintain the system yourself, make certain you are properly grounded before opening the system chassis. See "Static electricity precautions" on page 2, for more information on preventing electrostatic damage to the system.

CD-ROM problems

The system does not recognize the CD-ROM drive.

Probable Cause	Solution
The CD is not intended for PC use.	Make certain the CD is PC-compatible.
The CD is loaded incorrectly.	Make certain the label is facing upward, and then try again.
The CD is scratched or dirty.	Try cleaning the CD with a lint-free cloth. Check the CD for scratches.
The CD-ROM drive needs to be added as new hardware.	From the Control Panel window (**Start** | **Settings** | **Control Panel**), double-click **Add New Hardware**. Follow the directions to add the drive. If you are not experienced with this procedure, call technical support.
The secondary IDE device may be disabled.	Restart your computer, and then press F1 to enter the Setup program. From the **Advanced** | **Peripheral Configuration** menu, set the **Secondary IDE Interface** to **Auto** and make certain the **Secondary IDE Status** is **Enabled**.
The CD cables are not installed correctly.	Open the system and check all cables between the CD controller and the CD-ROM drive.

Hard disk problems

The system does not recognize the SCSI drive.

Probable Cause	Solution
The integrated SCSI controller may be disabled.	Restart your computer, and then press F1 to enter the Setup program. From the **Advanced** menu, set the **Embedded PCI SCSI: Channel A** or **Embedded PCI SCSI: Channel B** to **Enabled** as appropriate.
The SCSI bus is not properly terminated.	Make certain the last device on the SCSI chain is properly terminated.
The drive is configured with a conflicting SCSI address.	Change the device's SCSI address to one that is not currently being used by the system.
The cables are not connected correctly.	Open the system and check the cable connections.

The IDE drive is not recognized by the system.

Probable Cause	Solution
The Primary IDE Device may be disabled.	Restart the computer and press F1 to enter Setup. From the **Advanced	Peripheral Configuration** menu, set the **Primary IDE Interface** and **Primary IDE Status** to **Enabled**.
The primary IDE device may be configured incorrectly.	Restart your computer, and then press F1 to enter the Setup program. From the **Main** menu, set the **Primary IDE Master** to **Auto Configured**.
The drive may not be configured properly.	Consult the hard disk user's guide for instructions on how to configure the drive.
The drive cables are not connected properly.	Open the system and check all cables connected to the controller.

Memory/Processor problems

Memory errors were detected during system start up.

Probable Cause	Solution
Memory was added or removed, and the new configuration was not saved in BIOS Setup.	Enter BIOS Setup and save the new memory configuration.
The memory was installed incorrectly.	Check the memory for proper seating and orientation.
A memory chip is faulty.	Replace the DIMM with the faulty chip. (Third-party diagnostic programs can help determine which chip or memory segment failed.)
POST produces incorrect memory count.	If you have just added or removed memory from the system, you must allow POST to complete its memory count. If you do not, CMOS memory is not updated and the new memory total is not saved.

A new processor is not recognized by the system.

Probable Cause	Solution
The processor was installed incorrectly or in the wrong socket.	Check the installation. The processor should be recognized automatically if it was installed correctly.
The processor speed was not selected on the system board.	If your system board lets you to select the processor speed, make sure you have selected the proper speed.
A pin was bent on the processor during installation.	Remove the processor and inspect it for damage. If a pin is bent, very carefully try to straighten it.
The second VRM was not installed.	Make certain that you install the VRM for the application processor at the same time you install the processor. The VRM must be present for the processor to receive power.
Stepping information not included in table when adding a new processor.	Run the MULOADER utility.

Peripheral/Adapter problems

A SCSI device is not recognized by the system.

Probable Cause	Solution
The device needs to be added as new hardware.	From the Control Panel window (**Start** | **Settings** | **Control Panel**), double-click **Add New Hardware**. Follow the directions for adding the device. If you are not experienced with this procedure, call technical support.
The SCSI ID may be invalid.	Assign an available SCSI ID to the device.
The SCSI chain is not terminated.	Make certain the last device on the SCSI chain is terminated.
The device cables are not installed correctly.	Open the system and check all cables between the controller and the device.

The diskette drive is not recognized by the system.

Probable Cause	Solution
The diskette drive may be configured incorrectly.	Restart your computer, and then press F1 to enter the Setup program. From the **Main** | **Floppy Options** menu, ensure that the diskette drive settings are correct.
The drive cables are not connected properly.	Open the system and check all cables connected to the controller.

The diskette drive will not read, write, or format.

Probable Cause	Solution
The diskette is not IBM formatted.	Make certain the diskette you are trying to format is IBM-compatible. If it is, try reformatting it. If it is not, replace it with an IBM-compatible diskette
The diskette is corrupted.	Run ScanDisk on the diskette. If errors are detected and corrected, try accessing the diskette again.
The diskette is write protected.	Make certain the write-protection window on the upper-right corner of the diskette is closed (unprotected) or use an unprotected diskette.

The diskette drive LED illuminates continuously.

Probable Cause	Solution
The diskette is corrupted.	Remove the diskette from the drive. If the light remains on, try restarting the system.
The cable to the drive is not connected properly.	Open the system and check the cable between the diskette drive and the controller. Make certain the pins are not bent or misaligned.

An adapter card is not recognized by the system.

Probable Cause	Solution
The interrupt and/or I/O address is set incorrectly.	Check the address configuration of the adapter card and ensure that it does not conflict with another card in the system.
The card has not been configured through software (e.g., the EISA configuration utility).	Configure the card with the appropriate software.
The card was not installed correctly.	Reseat the card and make certain that its jumpers are configured appropriately.

Printer problems

The printer will not turn on.

Probable Cause	Solution
The printer is not plugged in.	Check the power cable. Make certain it is plugged into a live power source.
The printer is not turned on.	Make certain the printer power switch is on. If power is applied to the printer, the green power LED should be on.
The printer is defective.	Try another printer, if one is available.

The printer is turned on but will not print.

Probable Cause	Solution
The printer is not connected to the system.	Check the data cable between the printer and the system. Make certain it is connected to the proper port. Check the connector and cable for bent or broken pins.
The printer is not designated as the default printer.	If the printer to which you are trying to print is not the default printer, make certain you have selected it through the application's printer setup function.
The printer has not been added to the system.	From the Printers window (**Start** | **Settings** | **Printers**), double-click **Add Printer**. Follow the directions for adding the new printer.
The wrong driver is being used for the selected printer.	From the Printers window (**Start** | **Settings** | **Printers**), select the printer. From the **File** menu, click **Properties**. Make certain the printer is using the right printer driver. If not, install the correct one.

The printer prints garbled text.

Probable Cause	Solution
The wrong driver is being used for the selected printer.	From the Printers window (**Start** | **Settings** | **Printers**), select the printer. From the **File** menu, click **Properties**. Make certain the printer is using the right printer driver. If not, install the correct one.

System problems

The system will not start up.

Probable Cause	Solution
The system is not connected to an AC outlet.	Check the power cable(s) and make certain it is connected to an AC power source.
Voltage selection switch not set correctly.	Make certain the voltage selection switch reflects the correct power source.
One power supply is not supplying power to the load share module.	Verify both power cords are plugged into working AC outlets. Verify that both power cords are fully plugged into AC-in connectors on the back of the computer. Verify that both power supplies are set to the correct voltage range (115-V AC or 230-V AC). Verify that both power supplies are turned on. Replace defective power supply.

The keyboard doesn't work.

Probable Cause	Solution
A key was depressed while the system was starting up.	Clear the sticking key. Then turn off the system, wait for a few seconds, and then turn the system back on.
The keyboard is not plugged in or connected properly.	Check the cable. Make certain it is plugged in correctly.
Something spilled into the keyboard.	Turn off the system. Turn the keyboard upside down to let it dry before turning the system back on.
The keyboard is defective.	Try a keyboard you know is working.

The mouse doesn't work.

Probable Cause	Solution
The mouse is not plugged in or connected properly.	Check the cable. Make certain it is plugged in correctly.
The mouse driver did not load when the system booted.	Load the appropriate mouse driver manually or contact technical support.
The mouse is defective.	Try a mouse you know is working.

Video problems

The system is running but there is no display.

Probable Cause	Solution
The monitor is not turned on.	Make certain the monitor is plugged in and turned on. If power is applied to the monitor, the green power LED should light.
The monitor data cable is not connected.	Make certain the monitor data cable is connected to the video controller on the back of the system.
The connector or cable is damaged.	Check the connector and cable for bent or damaged pins.
The monitor is defective.	Connect a working monitor to the computer.
The monitor brightness and contrast controls are turned down.	Adjust the brightness and contrast knobs to the center position.
The video card is not seated correctly.	Open the system and reseat the video card.
The video card is not compatible with the system.	PCI video cards must be compatible with the system. Replace the video card with one that is compatible with the system.

★ *Important!*

The system board has a built-in video adapter, so there may not be a video adapter to remove and replace.

The text on the display is dim or difficult to read.

Probable Cause	Solution
The monitor brightness and contrast controls are turned down.	Adjust the brightness and contrast knobs until the text becomes clear.
Sunlight is glaring off the display.	Position the monitor away from the sun or window.
The CRT may be old.	Replace the monitor.

The color monitor displays everything in black and white.

Probable Cause	Solution
The system was turned on before the monitor.	Make certain the monitor is turned on, and then restart the system.
The display type is set incorrectly.	From the control panel window (**Start** | **Settings** | **Control Panel**), double-click **Display**, set the display to the appropriate monitor type, and then reboot the system.

The displayed characters are garbled.

Probable Cause	Solution
The video cable is damaged.	Check the cable and connectors for bent pins or broken wires.
The display setup is incorrect.	From the control panel window (**Start** | **Settings** | **Control Panel**), double-click **Display** and check the settings. The correct video type should be selected, along with a supported resolution. Check your monitor and video controller documentation for details.

The video is distorted.

Probable Cause	Solution
The monitor controls are not properly adjusted.	Adjust the monitor controls until the text becomes clear. See the monitor documentation for more information.
The connector or cable is damaged.	Check the connector and cable for bent or damaged pins.
The surge protector or uninterruptible power supply (UPS) is damaged.	Disconnect the monitor power cable and connect it directly to the power source.
The monitor is too close to a source of electrical interference.	Move the monitor away from sources of electrical interference, such as televisions, unshielded speakers, microwaves, fluorescent lights, and metal beams or shelves.
The monitor needs to be degaussed.	Turn off the computer and monitor and leave them off for at least a half hour, and then restart the system.

Error messages

This section lists common error messages that may be displayed on the monitor. These messages often indicate procedural errors such as an incorrect keystroke or a write-protected disk. Some messages, however, may indicate a problem that requires you to consult the troubleshooting section of this manual.

Error Message	Solutions
Access denied.	Try saving to a new file or disk. Move the write-protect tab over the hole on the back of the disk.
Bad command or file name.	Make certain you entered the right command. Verify the specified drive and try it again. If you are trying to exit MS-DOS to return to Windows, type **exit** and press ENTER.
Base memory [xxx] expansion.	This is an informational message only. No action is required.
Checking RAM on disk controller.	Your BIOS configuration is incorrect. Enter BIOS Setup and verify the parameter values.
CD-ROM is not recognized.	See "The system does not recognize the CD-ROM drive." on page 79.
Data error.	Run ScanDisk on the reported disk.
Decreasing available memory.	Your BIOS configuration is incorrect. Enter BIOS Setup and verify the parameter values.
Diskette drive is not recognized.	See "The diskette drive is not recognized by the system." on page 82.
Diskette drive 0 seek to track 0 failed.	Enter BIOS Setup and verify the diskette drive parameters. Check the diskette drive cables. Make certain pin 1 on the cable aligns with pin 1 on the connector.
Diskette drive reset failed.	Enter BIOS Setup and verify the diskette drive parameters. Check the diskette drive cables. Make certain pin 1 on the cable aligns with pin 1 on the connector.
Diskette read failed - strike F1 to retry boot.	Make certain the boot diskette contains the command.com file. Use the configuration utility (if applicable) to verify the drive or controller configuration. Press F1 to try the boot again.

Error Message	Solutions
Gate A20 failure.	You may have an XT keyboard connected to an AT system or vice versa. Make certain the keyboard is configured to work with the appropriate system. Some keyboards have a switch to select either AT or XT.
Hard disk controller failure.	Make certain the hard disk cable is properly connected. Open the BIOS Setup program and verify that the correct drive type is selected.
Hard disk controller failure - press F1 to try reboot.	The drive controller may be defective. Press F1 to retry the boot. Try running Fdisk and DOS Format. For more information, refer to the DOS documentation.
Insert bootable media device.	See "The IDE drive is not recognized by the system." on page 80. See "The system does not recognize the SCSI drive." on page 80. Backup your files as soon as possible.
Insufficient disk space.	Check the free space on the disk volume. If the volume is full or almost full, remove unnecessary files.
Invalid configuration information…	Enter BIOS Setup and verify the parameter values.
Invalid password.	Enter the password again, making certain to enter it correctly. If you do not know the password, you may need to reinstall the software you are trying to access. Startup passwords are stored in BIOS. If this password has been set and is unknown, you may be able to reset the password via system board jumper settings. See "Setting system board jumpers" on page 32 for more information.
Keyboard clock line failure.	Try a working keyboard. Make certain the keyboard is compatible with the system. You may have to change the switch setting to AT. Replace the keyboard chip.

Error Message	Solutions
Keyboard controller failure.	Try a working keyboard. Make certain the keyboard is compatible with the system. You may have to change the switch setting to AT. Replace the keyboard chip.
Keyboard controller failure.	Try a working keyboard. Make certain the keyboard is compatible with the system. You may have to change the switch setting to AT. Replace the keyboard chip.
Keyboard not detected.	See "The keyboard doesn't work." on page 85. Turn off the system and check the keyboard cable.
Keyboard stuck key failure.	Remove any objects that may be resting on the keyboard, and then restart the system. Check for sticky keys. Clean the keyboard if necessary.
Memory errors were detected while the system powered up.	See "Memory errors were detected during system start up." on page 81.
Memory size error.	Enter BIOS Setup and save the memory configuration.
Non-system disk or disk error.	Eject the diskette and press ENTER. If the diskette is bootable, check it for errors.
Not enough memory.	Close all programs not currently in use.
Print queue is full.	Wait until the current print job has completed before sending another print job. If you receive this error often, you need to add memory to the printer.
Printer is out of paper.	Add paper to the printer. Make certain the printer is online.
Required parameter missing.	Make certain you entered the right command. If you are trying to exit MS-DOS to return to Windows, type **exit** and press ENTER.
Syntax error.	Make certain you entered the right command. If you are trying to exit MS-DOS to return to Windows, type **exit** and press ENTER.
Time and date not set.	Enter BIOS Setup to set the system date and time.
Write protect error.	Move the write-protection tab over the hole on the back of the diskette.

A

Reference Data

Acronyms and abbreviations

ASIC - Application specific integrated circuit

BIOS - Basic input/output system

CMOS - Complementary metal-oxide semiconductor

DIMM - Dual inline memory module

DMI - Desktop management interface

DRAM - Dynamic random access memory

ECC - Error correcting code

FAT - File allocation table

GB - Gigabyte

IDE - Integrated drive electronics

IRQ - Interrupt request line

ISA - Industry standard architecture

LAN - Local area network

LED - Light-emitting diode

MB - Megabyte

Mbps - Megabits per second

MIDI - Musical instrument digital interface

MHz - Megahertz

MS-DOS - Microsoft disk operating system

NTFS - NT file system

POST - Power-on self-test

PS/2 - Personal System/2

RAM - Random-access memory

ROM - Read-only memory

SCSI - Small computer system interface

SDRAM - Synchronous dynamic random access memory

TCP/IP - Transmission control protocol/Internet protocol

V - Volt

Terms and definitions

This list of terms should help you get acquainted with terms used in your computer's documentation and in your system software.

Applications - Software installed on your system. Sometimes called *programs*.

BIOS - Basic input/output system. The BIOS is software that is independent of any operating system. It enables the computer to communicate with the monitor, keyboard, and other peripheral devices without using programs on the hard disk.

The BIOS on your computer is flash BIOS, which means that is has been recorded on a memory chip that can be updated if needed.

Boot - To load the first software program (usually the operating system) that starts your computer. To perform a cold (or hard) boot, you turn the computer on when it is off. To perform a warm (or soft) boot, you reset the computer when it is already turned on.

Boot disk - A disk containing operating system programs required to start your computer. A boot disk can be a diskette, hard drive, or CD.

Byte - The basic unit of measure for computer memory. A character, such as a letter of the alphabet, uses one byte of memory. Each byte is made up of eight bits. Computer memory is often measured in kilobytes (1,024 bytes) or megabytes (1,048,576 bytes).

Cache memory - Cache is very fast memory that can be located in the processor. Cache reduces the average time required for the processor to get the data it needs from the main memory by storing recently accessed data in the cache.

CMOS memory - Complementary metal oxide semiconductor memory. CMOS memory is memory that is retained even when the computer is turned off. The Setup program settings and other parameters are maintained in CMOS memory.

Default - The option that the software or system uses when you have not made a choice yourself.

Disc - A compact disc (CD).

Disk - The device used by the computer to store and retrieve information. Disk can refer to a diskette or a hard disk.

Diskette - A removable disk, also called a floppy.

Hard drive - The drive installed inside your computer that stores all your system and data files. Depending on its configuration, the computer may have more than one hard drive. Each drive is assigned its own drive letter. If you have only one drive, its drive letter is C, and it is often called "the C drive."

I/O - Input/output. Refers to devices, such as printers, whose purpose is to enter data into a computer or extract data from a computer. An I/O device is accessed through an I/O address: a location in memory reserved for the device to exchange information between itself and the rest of the computer.

IRQ - Interrupt request line. The IRQ is a hardware line that a device uses to signal the processor when the device needs the processor's services. The number of IRQs is limited by industry standards.

Operating system - A program that supervises the computer's operation, including handling I/O, networking and connectivity, and device drivers.

Path - A sequence of information that directs the system to the file it needs. For example, **c:\windows\bubbles.bmp** is the path to a graphics file on your system. The **c:** tells the system it is on the C hard drive, the **\windows** tells the system it is in the windows folder, and **bubbles.bmp** is the file.

Pixel - A pixel is an individual dot in a graphic displayed on your computer. Pixels are so close together that they look as though they are connected.

POST - Power-on self-test. POST tests your computer's components whenever you turn on the computer.

Programs - Software installed on your system. Programs are sometimes called *applications*.

RAM - Random access memory. RAM is the computer's system memory. You can write to and read from RAM. Information stored in RAM is temporary and is erased when the computer is turned off.

Refresh rate - The refresh rate is the rate at which the image on the monitor screen is rewritten to the screen. A fast refresh rate helps keep the image from flickering.

Resolution - The resolution is the sharpness or clarity of the image on the monitor screen. Resolution is measured by the number of pixels the screen can display. For example, a resolution of 800x600 means that the screen can display 800 pixels in a row and can display 600 rows. The more pixels displayed, the higher the resolution and the clearer the images.

ROM - Read-only memory. Permanent computer memory dedicated to a particular function. For example, the instructions for starting the computer when you first turn on power are contained in ROM. You cannot write to ROM.

Specifications

The following specifications are for the standard configuration; your system may contain optional equipment. All specifications are subject to change.

Summary	The system supports Pentium II Xeon processors running at 400, or 450 MHz. These processors fit into the slot 2 connectors on the system board. The system also supports seven expansion slots, six LVD SCA SCSI drives, onboard Ethernet, onboard SCSI controller, and a full complement of I/O ports
Dimensions	24.5"H x 7.75"W x 27.0"D, 65 lbs.
Processor	Intel Pentium II Xeon processor
Processor speed	400, or 450 MHz
Processor upgrade	Slot 2
Cache subsystem	512 KB, 1 MB, or 2 MB level-2 cache
RAM	64-MB standard, 2-GB maximum
BIOS	Phoenix
IDE interfaces	Two, supporting two IDE devices each
Diskette drive	1.44-MB 3.5-inch
I/O Ports	Two serial, one parallel, two USB, one RJ-45 LAN, video, mouse, and keyboard
Mouse/Keyboard	Yes
ISA/PCI Expansion Slots	Seven PCI/ one ISA (Three of the PCI slots and the ISA slot are shared slots, the second PCI slot is shared with a RAIDport slot and the third PCI slot is shared with an I_2O slot)
Certification	FCC Class A, TUV, CE, CSA, and UL approved

Memory Map

The following table gives descriptions of what the memory is used for at each address location.

Address (Decimal)	Address (Hexadecimal)	Size	Description
0-KB–640-KB	0000:0000–0009:FFFF	640-KB	Main memory for applications.
640-KB–768-KB	000A:0000–000B:FFFF	128-KB	Video graphics display buffer
768-KB–896-KB	000C:0000–000D:FFFF	128-KB	Reserved for ROM on I/O adapters
896-KB–1024-KB (1-MB)	000E:0000–000F:FFFF	128-KB	System BIOS ROM
Above 1-MB			
1-MB–16-MB	0010:0000–00FF:FFFF	15-MB	Extended Memory
15-MB–16-MB	00FE:0000–00FF:FFFF	64-KB	Mapped RAM or ROM
Above 16-MB			
16MB–1024-MB (1-GB)	0100:0000–3FFF:FFFF	1-GB (minus 16-MB)	Total accessible extended memory above 16-MB
128-MB–4084-MB (4GB minus 2MB)	0800:0000–FFFD:FFFF	3966-MB	Mapped to ISA slots
4-GB minus 64KB–4-GB	FFFF:0000–FFFF:FFFF	64-KB	System BIOS ROM

I/O Map

The following table gives descriptions of what the memory is used for at each address location.

Address (hex)	Size	Description
0000–000F	16 bytes	DMA-1
0020–0021	2 bytes	INT-1
0040	1 byte	Programmable interval timer 1
0041	1 byte	Refresh request counter 1
0042	1 byte	Speaker tone counter 2
0043	1 byte	Command mode register
0048	1 byte	Programmable interval timer 2
0049	1 byte	Reserved
004A	1 byte	CPU speed control counter 2
004B	1 byte	Command mode register
0061-0070	16 bytes	NMI status/registers
0080-008F	16 bytes	DMA page registers
00A0-00A1	2 bytes	INT-2
00C0-00DE	31 bytes	DMA2
0400-040F	16 bytes	DMA1
0461-0464	4 bytes	Extended NMI control
0480-048F	16 bytes	DMA high page register
04C2	1 byte	Reserved
04C6-04CE	8 bytes	DMA2
04D0-04DF	16 bytes	INT/DMA2
04E0-04FF	32 bytes	DMA

IRQ Usage

The following table lists the interrupt request lines (IRQs) that the system typically uses and which ones are available for use by add-on devices.

IRQ	Resource
NMI	
0	System Timer
1	Keyboard
2	Cascade
3	Serial port 2 (COM2)
4	Serial port 1 (COM1)
5	Secondary Parallel Port (LPT2)
6	Floppy Controller
7	Primary Parallel Port (LPT1)
8	Real Time Clock (RTC)
9	Cascade Redirect
10	Available
11	Available
12	PS/2 Mouse Port
13	Math Coprocessor
14	Primary Hard Disk
15	Secondary Hard Disk

DMA Usage

The following table lists the direct memory access (DMA) channels that the system typically uses and which ones are available for use by add-in devices.

DMA	Resource
0	Cascade
1	Available
2	Floppy Controller
3	Available
4	Redirect Cascade
5	Available
6	Available
7	Available

DIMM Configurations

Refer to the following table to configure your RAM.

Total		DIMM Bank A		DIMM Bank B		DIMM Bank C		DIMM Bank D	
RAM		Type	Size	Type	Size	Type	Size	Type	Size
32	2x72	16MB	2x72	16MB	-	-	-	-	-
32	4x72	32MB	-	-	-	-	-	-	-
48	2x72	16MB	2x72	16MB	2x72	16MB	-	-	-
48	2x72	16MB	4x72	32MB	-	-	-	-	-
64	2x72	16MB	2x72	16MB	2x72	16MB	2x72	16MB	-
64	4x72	32MB	4x72	32MB	-	-	-	-	-
64	4x72	32MB	2x72	16MB	2x72	16MB	-	-	-
64	8x72	64MB	-	-	-	-	-	-	-
96	8x72	64MB	4x72	32MB	-	-	-	-	-
96	8x72	64MB	2x72	16MB	2x72	16MB	-	-	-
96	4x72	32MB	4x72	32MB	2x72	16MB	2x72	16MB	-
128	16x72	128MB	-	-	-	-	-	-	-
128	8x72	64MB	8x72	64MB	-	-	-	-	-
128	8x72	64MB	4x72	32MB	4x72	32MB	-	-	-
128	8x72	64MB	4x72	32MB	2x72	16MB	2x72	16MB	-
192	16x72	128MB	8x72	64MB	-	-	-	-	-
192	16x72	128MB	4x72	32MB	4x72	32MB	-	-	-
192	16x72	128MB	4x72	32MB	2x72	16MB	2x72	16MB	-
192	8x72	64MB	8x72	64MB	8x72	64MB	-	-	-
192	8x72	64MB	8x72	64MB	4x72	32MB	4x72	32MB	-
256	32x72	256MB	-	-	-	-	-	-	-

Total		DIMM Bank A		DIMM Bank B		DIMM Bank C		DIMM Bank D	
RAM		Type	Size	Type	Size	Type	Size	Type	Size
256	16x72	128MB	16x72	128MB	-	-	-	-	-
256	16x72	128MB	8x72	64MB	8x72	64MB	-	-	-
256	8x72	64MB	8x72	64MB	8x72	64MB	8x72	64MB	-
384	32x72	256MB	16x72	128MB	-	-	-	-	-
384	16x72	128MB	16x72	128MB	16x72	128MB	-	-	-
384	16x72	128MB	16x72	128MB	8x72	64MB	8x72	64MB	-
512	32x72	256MB	32x72	256MB	-	-	-	-	-
512	32x72	256MB	16x72	128MB	16x72	128MB	-	-	-
512	32x72	256MB	16x72	128MB	8x72	64MB	8x72	64MB	-
512	16x72	128MB	16x72	128MB	16x72	128MB	16x72	128MB	-
1 GB	32x72	256MB	32x72	256MB	32x72	256MB	32x72	256MB	-
1 GB	64x72	512MB	32x72	256MB	32x72	256MB	-	-	-
1.5 GB	64x72	512MB	64x72	512MB	32x72	256MB	32x72	256MB	-
2 GB	64x72	512MB	64x72	512MB	64x72	512MB	63x72	512MB	-

Regulatory compliance statements

FCC notice

This device has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio or television reception. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio and television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help

This equipment has been tested and found to comply with the limits of a Class A digital device. The accessories associated with this equipment are as follows:

- Shielded video cable
- Shielded power cord

These accessories are required to be used in order to ensure compliance with FCC rules.

Industry Canada notice

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus as set out in the radio interference regulations of Industry Canada.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de Classe A prescrites dans le règlement sur le brouillage radioélectrique édicté par Industrie Canada.

CE notice

This Information Technology Equipment has been tested and found to comply with the following European directives:

[i]EMC Directive 89/336/EEC amending directive 92/31/EEC & 93/68/EEC as per

-EN 50081-1:1992 according to

EN 55022:1995 Class A

EN 61000-3-2:1995 or EN 60555-2:1986

EN 61000-3-3: 1995

-EN50082-1:1992 according to

EN 61000-4-2:1995 or IEC 801-2:1984

ENV 50140:1994 or IEC 801-3:1984

EN 61000-4-4:1988 or IEC 801-4:1998

[ii]Low Voltage Directive (Safety) 73/23/EEC as per EN 60950: 1992

VCCI notice

This is a Class A product based on the standard of the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). If this equipment is used in a domestic environment, radio disturbance may arise. When such trouble occurs, the user may be required to take corrective action.

この装置は、情報処理装置等電波障害自主規制協議会（ＶＣＣＩ）の基準に基づくクラスＡ情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

Australia/New Zealand notice

This device has been tested and found to comply with the limits for a Class A digital device, pursuant to the Australian/New Zealand standard AS/NZS 3548 set out by the Spectrum Management Agency.

Caution!

Disconnect power before servicing.

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